Installation/Operation

PelcoNet™ Transmission System

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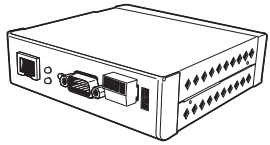

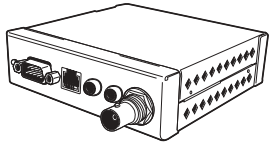

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IMPORTANT SAFEGUARDS AND WARNINGS

Observe the following warnings before installing and using this product.

1. Installation and servicing should be done by qualified service personnel only and conform to all local codes.

2. Unless the unit is specifically marked as a NEMA Type 3, 3R, 3S, 4, 4X, 6, or 6P enclosure, it is designed for indoor use only and it must not be installed where exposed to rain and moisture.

3. If the unit requires 120/230 VAC and does not have an on/off switch, the input power circuit must have a circuit breaker.

The product and/or manual may bear the following marks:

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

CAUTION:
RISK OF ELECTRIC SHOCK. DO NOT OPEN.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

Thoroughly familiarize yourself with the information in this manual prior to installation and operation.

Regulatory Notices

Note: This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INSTRUCTIONS FOR THE NETWORK ADMINISTRATOR

The PelcoNet™ Transmission System allows live video transmission to be viewed over TCP/IP-based networks. This section is intended to help the network administrator know what is involved with installing this product and how it will affect the network. The person installing the product will need the following information about the network to make the product function properly.

The Transmitter and Receiver

- A valid IP address* for each PelcoNet Transmission System unit
- Subnet mask*
- Default gateway (if applicable)
- E-mail server's IP address (if applicable)
- Dedicated maximum allowable amount of bandwidth for live video**

* = Required for the PelcoNet Transmission System to function properly.

** = The PelcoNet Transmission System requires a continuous amount of bandwidth to display true live video. Pelco recommends using switching hubs with the product so the amount of bandwidth available to each unit is constant and reliable.

The Browser

If you plan to use a browser to view live video across the network, there are procedures to complete before you can use the browser. If you installed Internet Explorer® 5.0 from the CD that came with the PelcoNet Transmission System, you can skip the following. Otherwise, complete the following before trying to use the browser.

1. Internet Explorer 5.x must be installed before continuing.
2. Set the computer's display settings to use 16-bit color. (This is required for the live video feature to function properly.)
3. Click on the **Start** menu in Windows®.
4. Click **Run**.
5. In the open box, type **Z:\PACTIVEX.EXE** (where Z = your CD ROM drive letter).
6. Click **OK**.
7. Follow the on-screen setup instructions to finish installing the plug-in.

WHAT IS THE PELCONET TRANSMISSION SYSTEM?

The PelcoNet Transmission System is a new technology that lets you view video in **real time** across a Local Area Network (LAN) and even Wide Area Networks (WAN). This technology is based on the TCP/IP protocol suite and Ethernet technology, providing compatibility with today's networking standards.

(See the *Glossary* section for definitions of terms used in this manual.)

How Do LANs and WANs Work?

- A LAN consists of multiple computers connected together, sharing information. This information could be files, e-mail, printers, or—with the PelcoNet Transmission System—even live video and audio.

- A WAN consists of multiple LANs connected over a great distance (for example, the Internet).

- In any network environment, each computer needs an address so other computers on the network know how to reach it.

  It is similar to a city with street addresses. For the post office to deliver mail to your house, you need a unique street address for the mail carrier to find you. A network is like the city. Like a street address, the IP address on your computer is your address on the network. The IP address is how other computers can find you on the network.

  Remember that the **IP address must be unique on the network**.

- When there are multiple networks and you are using the TCP/IP protocol, there must be a way to communicate between the two networks. A physical device called a router is required. The router's IP address is referred to as the default gateway IP address.

- A cable that connects one computer to another is like a city street you can use to get from one house to another. The cable lets you communicate with each other on the network. This cable is Category 5 cable with RJ-45 connectors at each end. (It looks like a phone cord, only slightly larger.)

Who Should Install The PelcoNet Transmission System?

NOTE: *Consult your network administrator if you need help.*

Installation is a matter of configuring an IP address using a standard terminal program or any Internet browser and connecting the PelcoNet Transmission System to the Ethernet network. You should have the following background and experience to configure and install these units:

- Working knowledge of basic network management concepts and terminology
- Working knowledge of tools and procedures for installing and operating sensitive electronic equipment

OVERVIEW

NOTE: *This manual refers to the PelcoNet Transmission System unit when discussing features, functions, or specifications that apply to both transmitter and receiver models. "Receiver," as used in this manual refers to a PelcoNet Transmission System receiver unless otherwise noted.*

Description

The PelcoNet Transmission System lets you transmit and receive live video, audio, and data over existing Ethernet computer networks (either intranet or Internet) using the TCP/IP protocol. You can view the picture on a CCTV or PC monitor.

The PelcoNet Transmission System consists of two units: a transmitter (NET101T/NET101T-A) and a receiver (NET101R/NET101R-A)—however, only the transmitter is required to use the PelcoNet Transmission System. The transmitter connects any NTSC or PAL video source (cameras, for example) to the computer network.

Depending on how you want to display the video, you can use just a transmitter or a transmitter and a receiver. There are two ways to display remote video:

- A hardware receiver and attached standard NTSC or PAL monitor
- Web browser using any PC on the network to display the video

Transmitters and receivers are identified by IP addresses, just like any other equipment connected to a computer network.

There is a bi-directional serial interface for remote control of peripherals like PTZ cameras. Transmission of full duplex audio is an option.

Software Version

This manual documents PelcoNet software version 5.24.

Package Contents

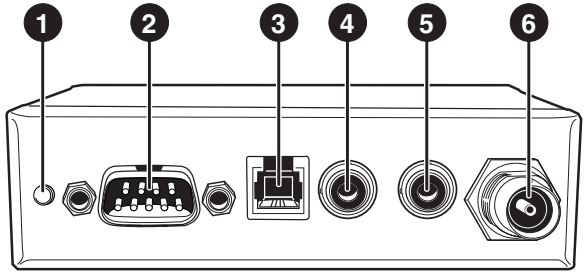
The product package contains the following items:

- Transmitter (NET101T/NET101T-A) or receiver (NET101R/NET101R-A)
- AC plug power adapter, 5 VDC output
- CD

Keep the carton, including the original packaging material, to repack the equipment if you need to return it for repair.

Front Panel Connectors

The PelcoNet Transmission System uses a compact design. One reason for the compact design is that connectors are placed on both the front and rear panels. The front panel connectors are dedicated to the media interfaces (video, audio, and data). They are shown in Figure 1.



Key:
1 = Green power LED (blinks slowly when connected to another PelcoNet Transmission System unit)
2 = RS-232 transparent data port for connecting to peripheral equipment
3 = Handset port (only with audio option)
4 = Audio line output (only with audio option)
5 = Audio line input (only with audio option)
6 = Video input (for transmitter) or video output (receiver)

Figure 1. Front Panel Connectors

Audio connectors 3, 4, and 5 only function on units equipped with the optional audio interface. Other than audio, there is no difference in features between regular and audio-equipped units; therefore, all information given for the basic transmitter and receiver units also applies to models with audio capability.

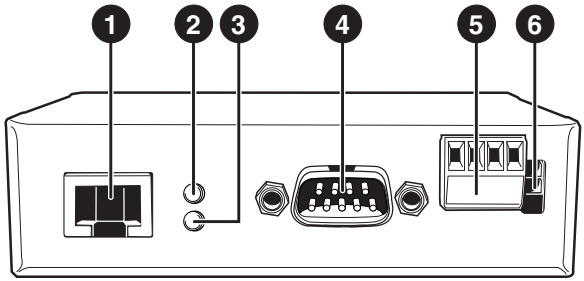
The green power LED lights as soon as you apply power to the unit.

The serial interface for transparent data transmission only provides serial send (pin 3) and receive (pin 2) signals and ground (pin 5). No hardware flow control signals are provided.

The handset interface lets you directly connect a telephone handset. Either the handset or the line interface is active at any given time. Selection of the interface is described in the *Configuration* section. For a detailed description of the audio interface, see the *Hardware Installation* section.

Rear Panel Connectors

The network interface, a terminal port for configuration and management, an alarm I/O-port, and the power connector reside on the unit's rear panel (see Figure 2).



Key:

1 = Ethernet port for connecting the PelcoNet Transmission System to the LAN with Ethernet (Cat5) cable
2 = Yellow TX LED for monitoring packet-sending over the UTP port
3 = Green LINK LED for link test of UTP connection
4 = RS-232, for connecting to the serial port of a PC
5 = Alarm input and relay output
6 = Power connector for connecting the AC plug power adapter

Figure 2. Rear Panel Connectors

The green LINK LED provides LAN status information. If the LED is on, the LAN port is properly connected and synchronized to a LAN. The yellow TX (transmit) LED blinks each time information is transmitted. The LED does not blink when information is received.

The RS-232 control terminal lets you connect to the serial port of a PC for simple configuration and/or operation of management functions. The interface features the full suite of RS-232 flow control signals.

The alarm I/O port lets you directly connect external signaling devices (for example, contacts). Also, the relay output facilitates switching of peripheral devices (lights or electric door openers, for example).

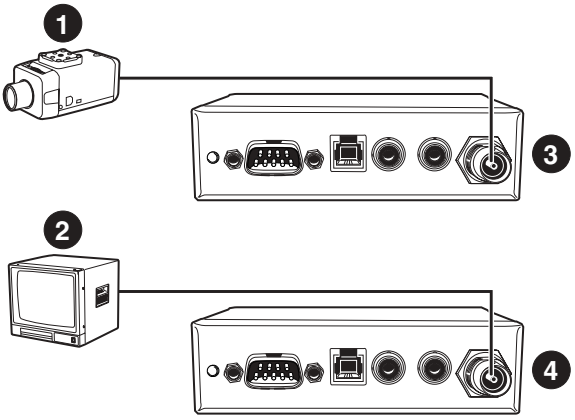
NOTE: *Use only the supplied AC plug power adapter. If the adapter, the cable, or the connector show any sign of damage, do not use the power adapter. Send it in for repair or replacement. Never try to use any power adapter except the supplied one.*

See the *Hardware Installation* section for information on interfacing peripherals to the unit.

QUICK INSTALLATION GUIDE

Follow the next seven steps for the fastest way to get your product up and running.

Step 1: Connecting A Camera Or Monitor



Key:
1 = Camera or other video source with composite PAL or NTSC output
2 = Video monitor with composite PAL or NTSC input
3 = Transmitter
4 = Receiver

Figure 3. Connecting A Camera Or Monitor

- To connect a camera, plug one end of a standard coaxial cable into the BNC connector on the front of the transmitter unit and the other end into the camera. You can use any video source with a composite PAL or NTSC output.

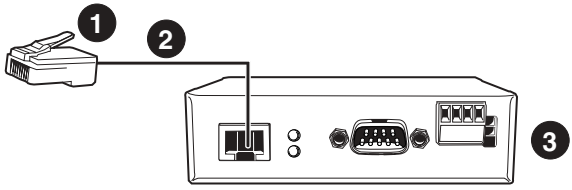
- To connect a monitor, plug one end of a standard coaxial cable into the BNC connector on the front of the receiver unit and the other end into the monitor. You can use any PAL or NTSC video monitor with a composite PAL or NTSC input.

For more information about video sources and monitors, see the *Hardware Installation* section.

Step 2: Connecting Additional Items

Connect any additional items, such as alarms, audio, etc.

Step 3: Connecting To The LAN Port

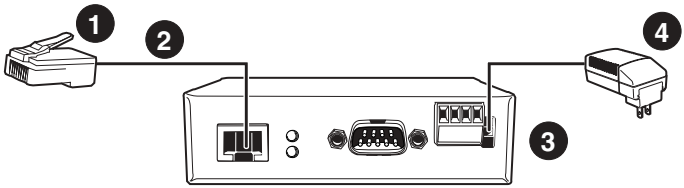


Key:
1 = Ethernet (10BASE-T) LAN connection to hubs, network, PCs (RJ-45 connector)
2 = Ethernet Cat5 cable
3 = Transmitter or receiver

Figure 4. Connecting To The LAN Port

To connect to the Ethernet network, use a standard UTP Cat5 cable with RJ-45 connectors. Plug this cable into the RJ-45 receptacle labeled “Ethernet/UTP” at the rear of the unit. The connection to a 10BASE-T network can be made directly via a hub or switch.

Step 4: Connecting Power



Key:
1 = Ethernet (10BASE-T) LAN connection to hubs, network, PCs (RJ-45 connector)
2 = Ethernet Cat5 cable
3 = Transmitter or receiver
4 = AC plug power adapter

Figure 5. Connecting Power

Attach the power adapter. Plug the primary side into the wall outlet and the secondary side with the small clip into the unit.

The green power LED on the front is lit constantly when the power adapter is connected correctly.

The green LINK LED next to the RJ-45 connector indicates a correct connection to the Ethernet network.

Step 5: Selecting An IP Address For Your Network

***NOTE*:** *Consult your network administrator for a valid IP address.*

The transmitter comes with the default address 192.168.0.1 while the receiver's default address is 192.168.0.2. Before operating the system inside your own network, you need to set a valid IP address.

Use a terminal program attached at the RS-232 control terminal port to change the IP address.

Refer to the *Configuration Using A Terminal Program* section for a description of IP address configuration using a terminal program.

Step 6: Using A Web Browser To Configure The Network

Configure the network using a web browser. Start your web browser and connect to the URL **http://IP-Address**, where IP-Address is the IP address of the unit you want to configure. Use the standard dot-separated format (x.x.x.x) to enter the address.

Refer to the *Configuration Using A Web Browser* section for detailed configuration instructions.

Step 7: What Next?

The system essentially is ready to use at this point. What you do now is up to you. For example, you can connect to the web browser to watch a camera view or configure additional options (alarms, default gateways, etc.) on the configuration pages.

TYPICAL APPLICATIONS

Displaying Remote Video On A Web Browser

The transmitter uses Motion-JPEG video compression or high performance H.323 coding for transmitting across the network. This enables transmission to standard web browsers of either live video (Live Video mode) or a stream of still images (Server Push mode).

- To activate the Live Video feature, click on **Live Video** above the video window on the PelcoNet Transmission System home page (see Figure 6). The unit transmits using the H.323 coding format for display in the browser.

  To stop Live Video, click on any other option at the top of the page.

- To activate the Server Push feature, click on **Server Push** above the video window on the home page. The unit continuously grabs snapshots to be JPEG encoded, transferred, and displayed continuously by the browser.

  To stop Server Push, click on any other option at the top of the page.

The PelcoNet Transmission System can display live video to five users at a time. A sixth user connecting to the same transmitter cannot receive live video.

However, Server Push can support multiple users simultaneously on the same transmitter. Image quality is good with an update rate of one image about every 2 to 10 seconds depending on the number of users and available bandwidth.

Browsers that do not support live video technology can display an updated still image or a stream of images in Server Push mode.

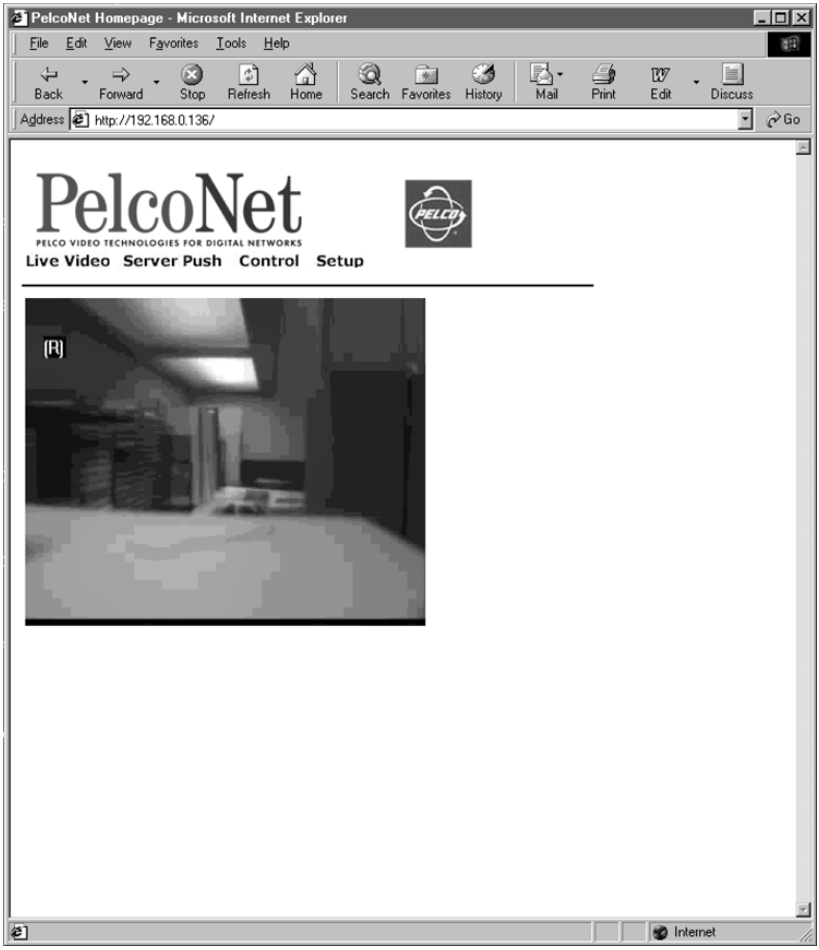

PelcoNet Homepage - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss
Address http://192.168.0.136/
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
(R)
Internet

Figure 6. PelcoNet Home Page

Displaying Video Via a Transmitter-To-Receiver Connection

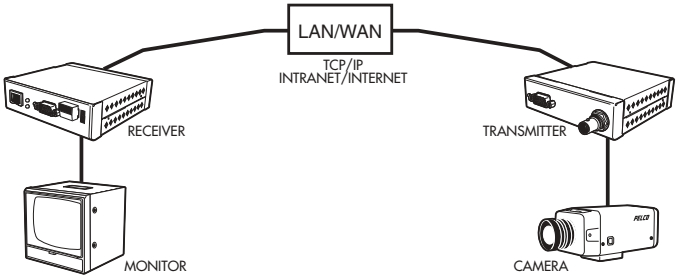


Figure 7. Configuration For Box-To-Box Connections

There are two ways to make a high performance multimedia transmission system for computer networks:

- One way is to use just the transmitter and connect it through the computer network to a PC with a web browser at the receiving end.

- Another way is to connect the transmitter through the computer network to a receiver. This is often called a box-to-box connection because it uses two PelcoNet Transmission System units.

In either case, routing dedicated cables from a camera to a monitor is not required because you can use the existing computer network for that purpose.

The following explains a box-to-box connection.

1. First, transmitter and receiver need to be configured appropriately. If the units are supposed to be operated in different subnets, a gateway IP address must be configured. Use the alarm IP address field to address the destination. Enter the settings using either a terminal program or a web browser.

2. Once all addresses are configured, type **c** in the terminal window to establish the actual connection or program the live video receive IP and enable the live auto connect setting through the web browser. Make sure the alarm IP address in the unit that will initiate the connection points to the destination unit. After a few seconds, video transmission begins and the camera scene appears on the monitor attached to the receiver.

   Instead of using a terminal program for establishing a connection, you can attach a contact to the alarm input. Make sure the alarm input is enabled.

You can use a web browser to connect any one of the two units, even during an active box-to-box connection. This way you can make changes to the configuration and immediately see the result of the setting (for example, when changing video quality). If you are connected to the transmitter, the camera picture is sent to the receiver and web browser simultaneously. There will be a short break in the video display on the receiver monitor whenever the web browser requests a new frame. This is especially noticeable with the “Server Push” feature.

Full duplex audio can be transmitted in parallel with the video transmission in units that have the audio option. To do so, you need to use the web browser to enable audio on the Audio Settings Configuration Page.

Transparent data is always transmitted automatically between the two units as soon as the connection becomes active. Data bytes entering the interface are transported to the other end transparently. There is no flow control mechanism for the data channel. Overflowing the serial interface will cause data loss.

To sever the connection from either end, type **d** in the respective terminal window (or disable the alarm).

Diagrams of Typical Applications

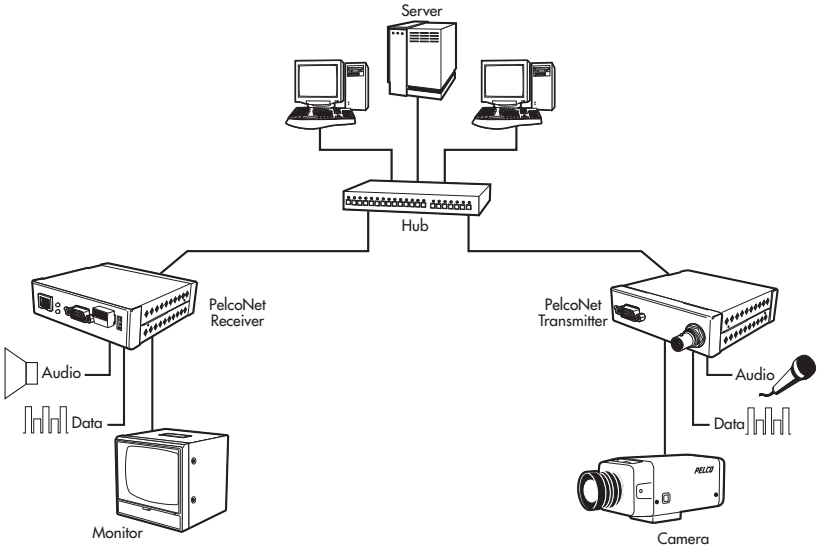


Figure 8. LAN Box-To-Box Connection (Transmitter, Receiver, Fixed Camera)

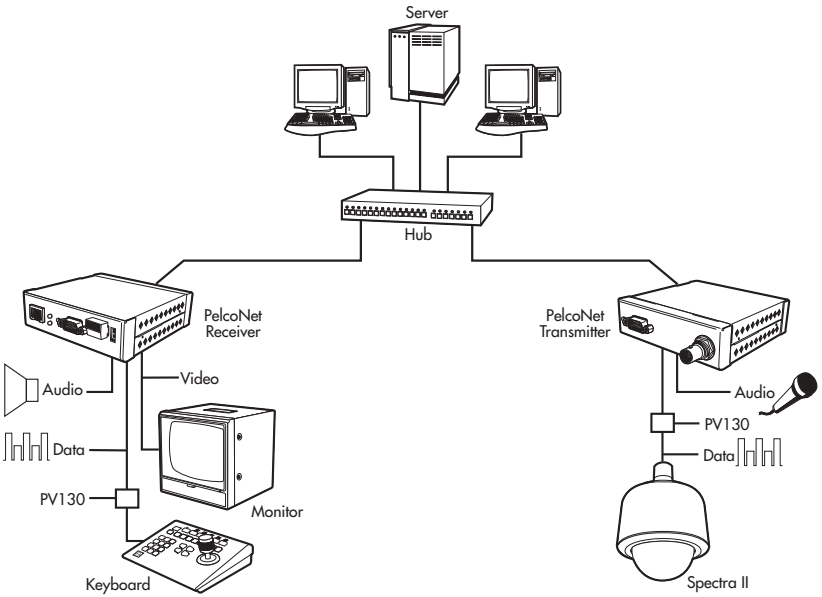


Figure 9. LAN Box-To-Box Connection (Transmitter, Receiver, Spectra II™)

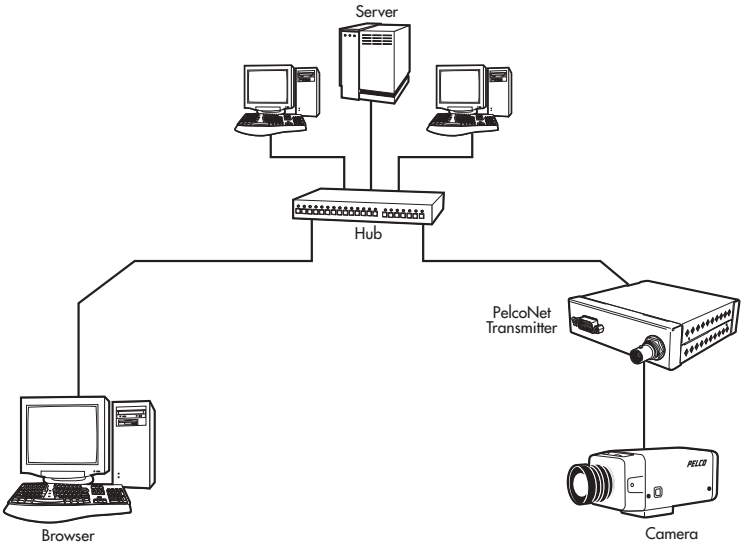


Figure 10. LAN Browser-To-Box Connection (Transmitter, Browser, Fixed Camera)

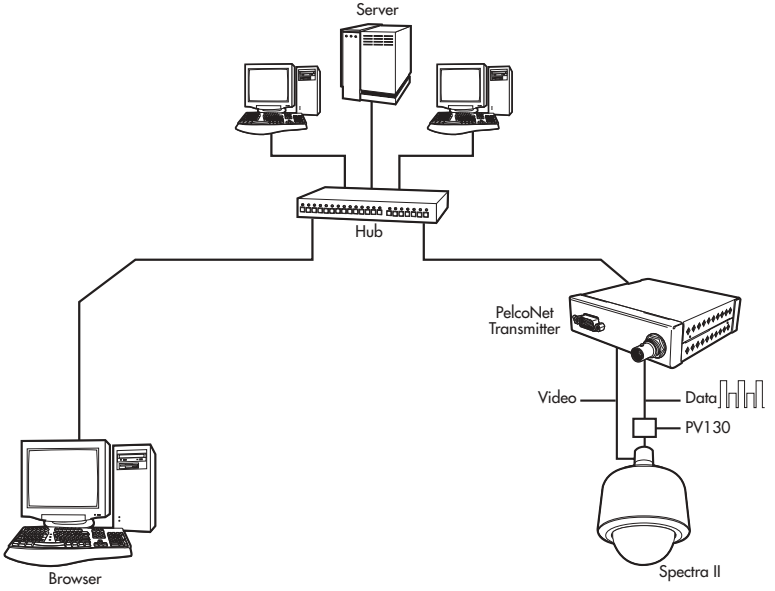


Figure 11. LAN Browser-To-Box Connection (Transmitter, Browser, Spectra II)

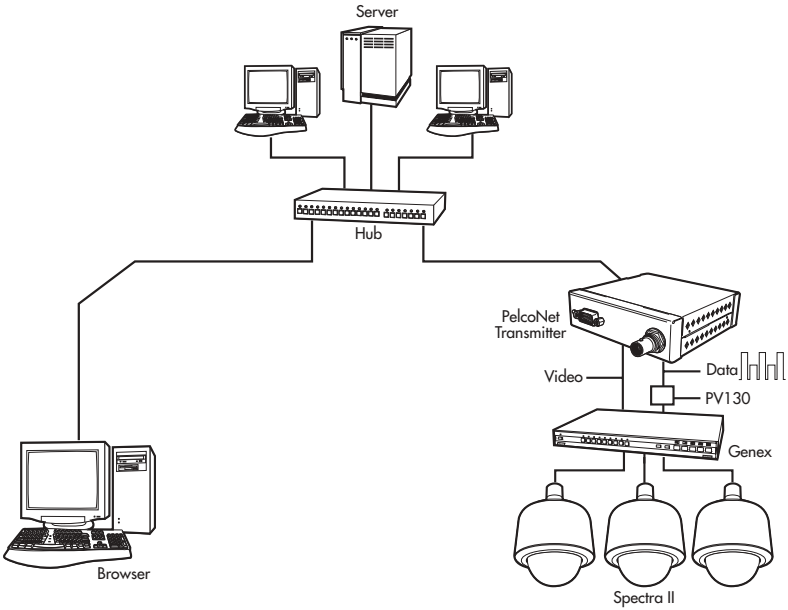


Figure 12. LAN Browser-To-Box Connection (Transmitter, Browser, Spectra II, Genex®)

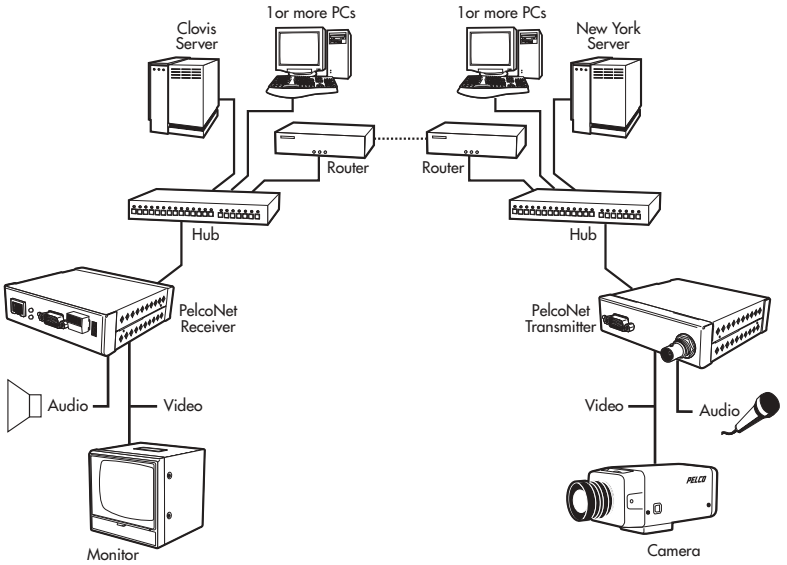


Figure 13. WAN Box-To-Box Connection (Transmitter, Receiver, Fixed Camera)

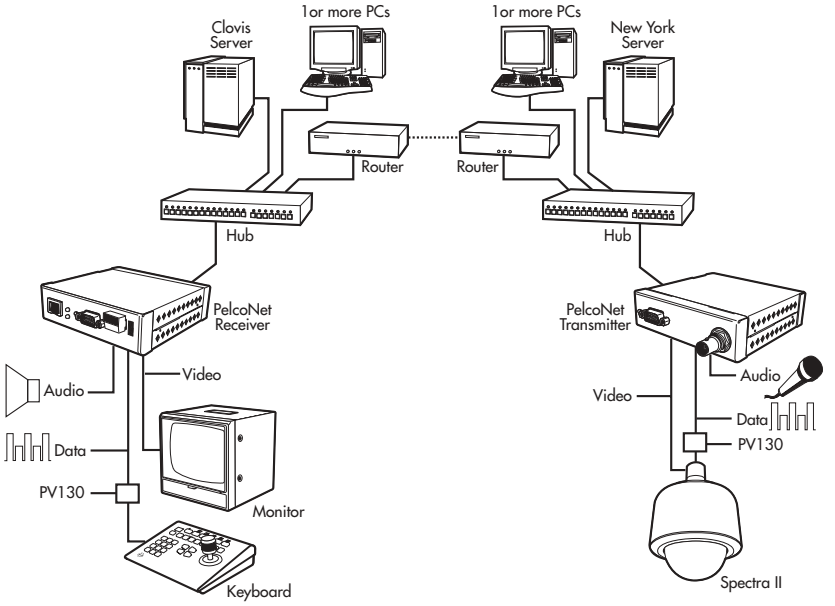


Figure 14. WAN Box-To-Box Connection (Transmitter, Receiver, Spectra II)

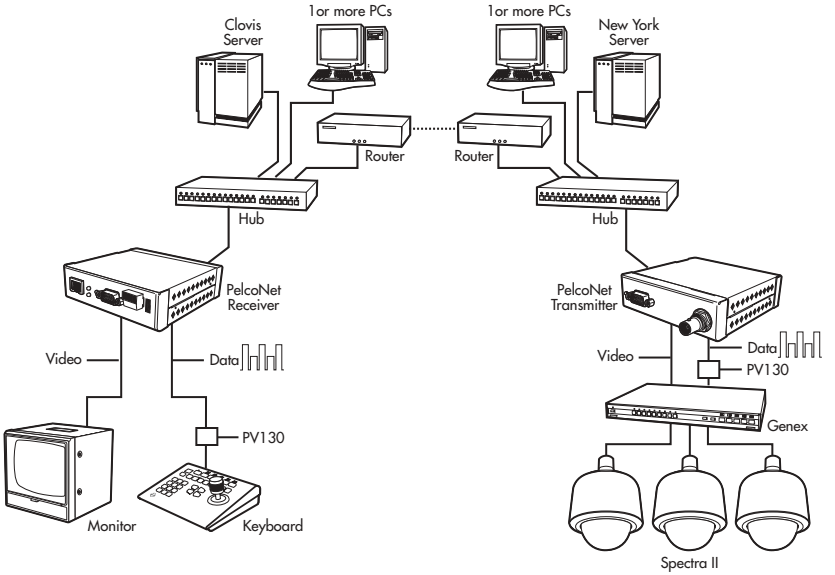


Figure 15. WAN Box-To-Box Connection (Transmitter, Receiver, Spectra II, Genex)

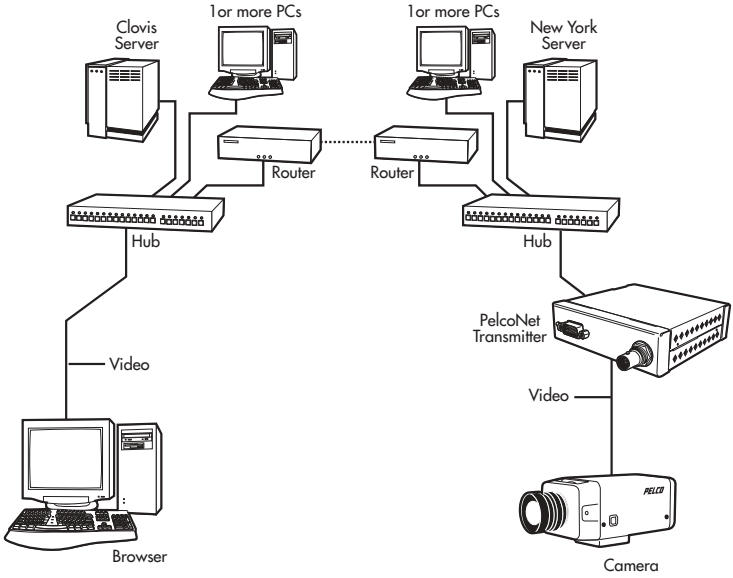


Figure 16. WAN Browser-To-Box Connection (Transmitter, Browser, Fixed Camera)

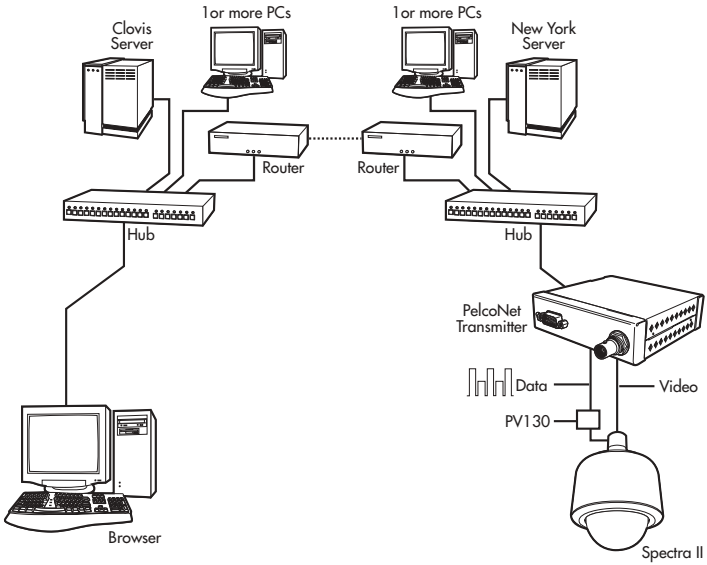


Figure 17. WAN Browser-To-Box Connection (Transmitter, Browser, Spectra II)

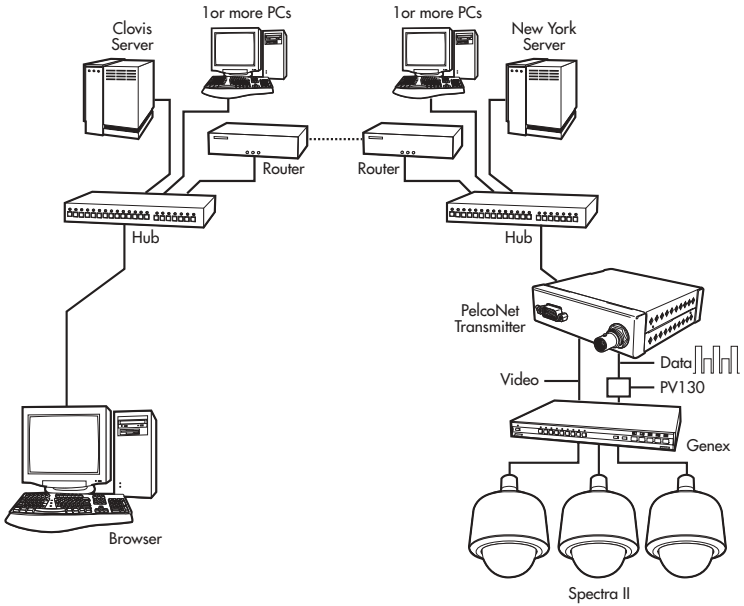


Figure 18. WAN Browser-To-Box Connection (Transmitter, Browser, Spectra II, Genex)

HARDWARE INSTALLATION

Refer to *Appendix A - Connecting PelcoNet to Different Components* for diagrams that show various connections.

Connecting Video Sources Or Displays

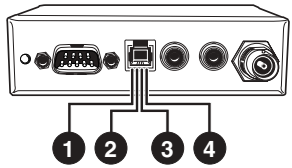
- To connect a camera, plug a standard coaxial cable into the BNC connector at the front of the transmitter. You can connect any camera or other video source (for example, a VCR with a composite PAL or NTSC output). The input accepts color or black and white sources and automatically detects whether it is PAL or NTSC. When using a VCR as an input source, you can improve the video quality by setting the Input Source to VCR in the Video Settings Configuration Page (see the *Configuration* section). The video input has an internal termination of 75 ohms.

- To connect a monitor, use a standard coaxial cable and plug it into the BNC connector at the front of the receiver. Any PAL or NTSC video monitor with a composite PAL or NTSC input can be connected. Moreover, a VCR can be connected to store the received video on a VCR tape.

The default output format is composite NTSC. To switch the video output to composite PAL, set the Output Standard to PAL on the Video Settings Configuration Page (see the *Configuration* section). You must then reboot the unit for the change to take effect.

Connecting Audio Equipment

The two audio channels available if the unit has the audio option are called handset and audio in/out. Only one of these two can be active at a time.



Key:
1 = Handset microphone, positive terminal
2 = Handset speaker, positive terminal
3 = Handset speaker, negative terminal
4 = Handset microphone, ground terminal

Figure 19. Pin Assignment Of The Handset RJ-11 Receptacle

You can connect a handset to the RJ-11 receptacle labeled Handset on the front of the PelcoNet Transmission System. To select this audio interface, put a checkmark in the radio button labeled Handset on the Audio Settings Configuration Page.

You can also set the input and output level (from 0-100%) on this configuration menu. And, the coding mode at the sending side can be set (using the menu item Coding Mode) between two different modes or switched off.

The audio decoder automatically follows the selected audio coding of the transmitter. If the receiver cannot decode the selected mode, an automatic fall-back to the next available audio mode occurs.

The second audio channel is available at the two RCA jacks labeled Audio In and Audio Out at the front of the unit. To choose this channel, select the radio button Line In/Out on the Audio Settings Configuration Page. Level and coding mode settings apply to this channel in the same manner as described above for the first channel.

Connecting Data Terminals

The unit has two serial interfaces—one at the back and another at the front. They serve different purposes and cannot be used interchangeably, as explained in the following.

Control Terminal Port

For local control and configuration of the unit, you can connect a data terminal (for example, a PC running a standard terminal program) to the serial interface labeled Control Terminal on the rear panel. The 9-pin DSUB connector features a standard RS-232 interface that can be connected to a PC's COM port.

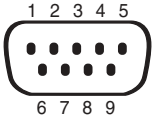
You can use a standard terminal program to communicate with the unit. The default parameters are set to 19200 baud with 8 bits of data, 1 stop bit and no parity bit (8N1).

To access the online help, type **?** (a question mark) in the terminal window. For more information on the command set, see the *Configuration* section. This mode allows the control port to be used to send serial data that requires flow control.

You can configure the RS-485 halfduplex mode in the web browser. The RTS and CTS signals are enabled for flow control.

If this RS-485 mode is chosen, the camera control data is transferred automatically to the Control Terminal port. Certain cameras with fixed data length require the buffered RS-485 mode. (This halfduplex mode is not required for interfacing to any Pelco product.)

VIEWED FROM SOLDERING SIDE OF PLUG



Pin	Name	Direction	Description
1	DCD	Input	Data Carrier Detect
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	DTR	Output	Data Terminal Ready
5	GND		Ground
6	DSR	Input	Data Set Ready
7	RTS	Output	Ready To Send
8	CTS	Input	Clear To Send
9	-	-	-

Figure 20. Control Terminal Port Pin Assignments in RS-232 Mode

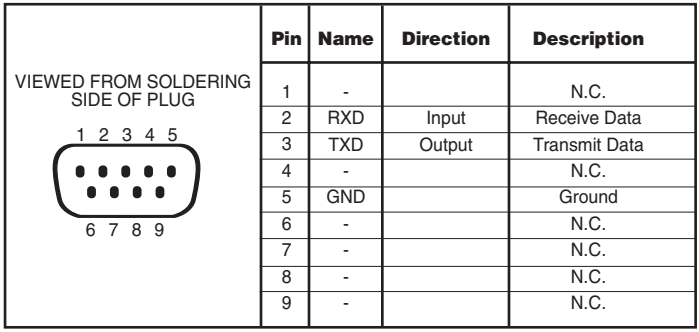
Transparent Data Port

The second serial interface, on the unit's front panel, offers a transparent serial data channel between the receiver and the transmitter. A typical application for the transparent data channel is remote control of peripheral equipment (PTZ functions of selected cameras, for example). You can also use this channel for remote control of any external device with a serial interface. The serial data is transferred in parallel to the video and audio data.

Transmission of transparent data is enabled only after a video connection has been established. Also, the RS-232 interface for the transparent data port does not support hardware flow control.

For proper operation, you must configure the following in a way that they fit the associated unit: baud rate, parity of the interface of the PelcoNet Transmission System unit, and number of data and stop bits. Use a web browser to configure these parameters at the unit with the configuration side.

The Transparent Data interface is used to remotely control PTZ cameras, transmit data transparently between two units, or for equipment connected to a PC COM port. This is only true when the units are connected. Only the data transmitting signals are provided at this port.

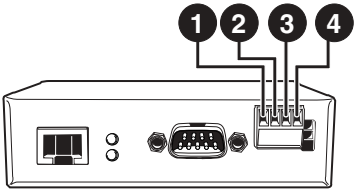


Pin	Name	Direction	Description
1	-		N.C.
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	-		N.C.
5	GND		Ground
6	-		N.C.
7	-		N.C.
8	-		N.C.
9	-		N.C.

Figure 21. Transparent Data Port Pin Assignments in RS-232 Mode

Connecting External Sensors and Controlling Peripheral Devices

The unit has an alarm input to use for external signaling devices, like door contacts or motion detectors. You can connect switches or contacts directly without a separate power supply. The alarm input is located on the two left pins of the detachable screw terminal (see Figure 22).



Key:
1 = Alarm input, positive terminal
2 = Alarm input, ground terminal
3 = Relay output, Y
4 = Relay output, Z

Figure 22. Pin Assignment Of The I/O Connector

Connecting pin 1 to pin 2 activates the input. You can configure alarm triggering to occur when the contact between pin 1 and pin 2 closes (normally open) or opens (normally closed). You can also configure alarm action (for example, connecting to an alarm IP address or sending an alarm e-mail). See the *Configuration* section for information on the possibilities.

The relay output can be operated interactively, during an active connection, or automatically to coincide with certain events. Settings for the relay must be configured (see the *Configuration* section).

Typical applications of the relay output are activating electric door openers or switching of lights and other electrical devices. Do not exceed the maximum rating of 24V/0.5A.

Connecting To A LAN

To connect to a 10BASE-T network, plug a standard UTP/Cat5 cable with RJ-45 connectors into the receptacle labeled Ethernet/UTP on the rear of the unit. You can connect directly to the Ethernet network. The green LINK LED on the rear of the unit lights as soon as the connection to the network is physically correct and synchronized with the LAN. Check the cable or see the *Troubleshooting* section if the LED does not light.

The yellow TX LED above the LINK LED is lit whenever the unit is transmitting over the network.

CONFIGURATION

There are two ways to configure your system:

- The most basic control and configuration is accomplished by connecting a terminal to the RS-232 terminal port.

- A more complete configuration and display of video is through the built-in HTTP server, which connects to any standard web browser.

Configuration Using A Terminal Program

Using a terminal program connected to the RS-232 terminal port on the unit's rear panel provides limited configuration and control capabilities (null modem cable required). Ensure that the COM port of the PC is set up properly (default parameters are 19200 baud, 8N1) and that the local terminal echo is disabled.

All commands consist of single characters you type inside the terminal window. The following section shows a typical terminal session.

Typical Session

Typing a question mark prompts the unit to display the help screen in the terminal window, as follows:

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
Help menu
?       this site
i       set the IP address
s       set the subnet mask
g       set the gateway IP address
a       set the alarm IP
c       connect to alarm IP
d       disconnect
m       display MAC address
v       display version information
b       display current data rate

disable 'local echo' for a better display !

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

If you are using the terminal to set up the unit's IP address, just type **i** and you are prompted to enter a new IP address:

```
i
->Enter new IP address (old:192.168.0.1): 192.168.0.5 (Enter)
->IP address set to 192.168.0.5
```

NOTE: *You cannot enter backspaces during a terminal session—if you mistype a character, end your entry by pressing ENTER and try again. If you see duplicate characters on any entry, the "local echo" feature of your PC's terminal program is not disabled.*

If you want to establish a live video connection to a remote unit, you have to specify the remote IP address by typing **a** and entering the remote IP address in the same manner as the unit IP address as shown in the example above.

To establish a connection, type **c**; to disconnect, type **d**. Be sure **not** to connect two units of the same type (for example, receiver-to-receiver).

Command Reference

The following table gives an overview of all available commands. (Enter the appropriate information where indicated by the quotation marks below. Do not enter the quotation marks.)

Table A. Terminal Command Reference

Cmd	Description
?	Displays the help screen.

i	Set up a new IP address.
	
	`->Enter new IP address (old:192.168.0.1): 'new IP address' [ Enter]`
	
	`->IP address set to <new IP address>`

s	Set up a new subnet mask.
	
	`->Enter new subnet mask (old:255.255.255.0): 'new subnet mask' [ Enter]`
	
	`->subnet mask set to <new subnet mask>`

g	Set up a new gateway IP address.
	
	`->Enter new gateway IP address (old:192.168.0.10): 'new gateway IP address' [ Enter]`
	
	`->gateway IP address set to <new gateway IP address>`

a	Set up a new alarm IP to connect to.
	
	`->Enter new alarm IP address old:192.168.0.3): 'new alarm IP address' [ Enter]`
	
	`->Alarm IP address set to <new alarm IP address>`

c	Connects a live video to the specified alarm IP. `->connecting...` PelcoNet tries to call the alarm IP host `connected` PelcoNet has established the connection
d	Disconnects any pending video connection. `->disconnecting...` PelcoNet disconnects `disconnected` PelcoNet has disconnected
m	Display the unit's MAC address. `->MAC address: <unit's MAC address>`

(Continued on next page)

Table A. Terminal Command Reference (continued)

v	Display version information. `>HW version: <version number> SW version: <version number>`
b	Displays the current transmission data rate. The display is updated continuously.

Configuration Using A Web Browser

In addition to the aforementioned configuration using a terminal program, which only covers the most basic settings, a web browser is the tool of choice for a more complete configuration. To accomplish this, the system features a complete HTTP server.

Microsoft®'s Internet Explorer 5.x is the recommended browser.

Web Server Concept

Start your web browser and connect to the URL **http://IP-Address**, where IP-Address is the IP address of the unit you want to configure. Use the standard dot-separated format (x.x.x.x) to enter the address.

The HTTP server provides five separate pages for configuration.

You can return to the home page from any other page by clicking on the PelcoNet logo on the left side. Clicking on the Pelco® logo while on the home page immediately transfers you to the Pelco Internet home page, provided the network allows for Internet access.

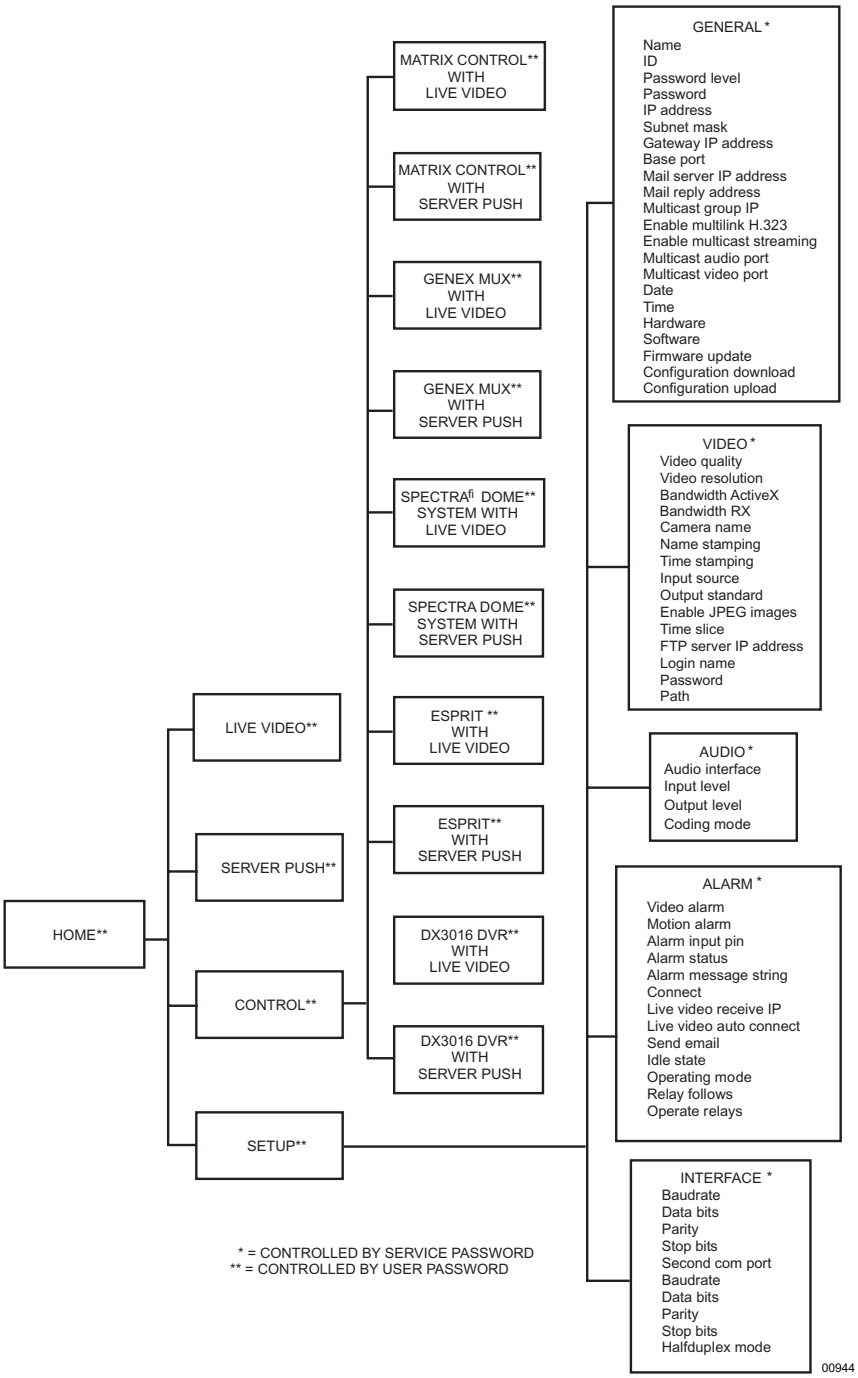


Figure 23. PelcoNet Menu Tree

PelcoNet Home Page

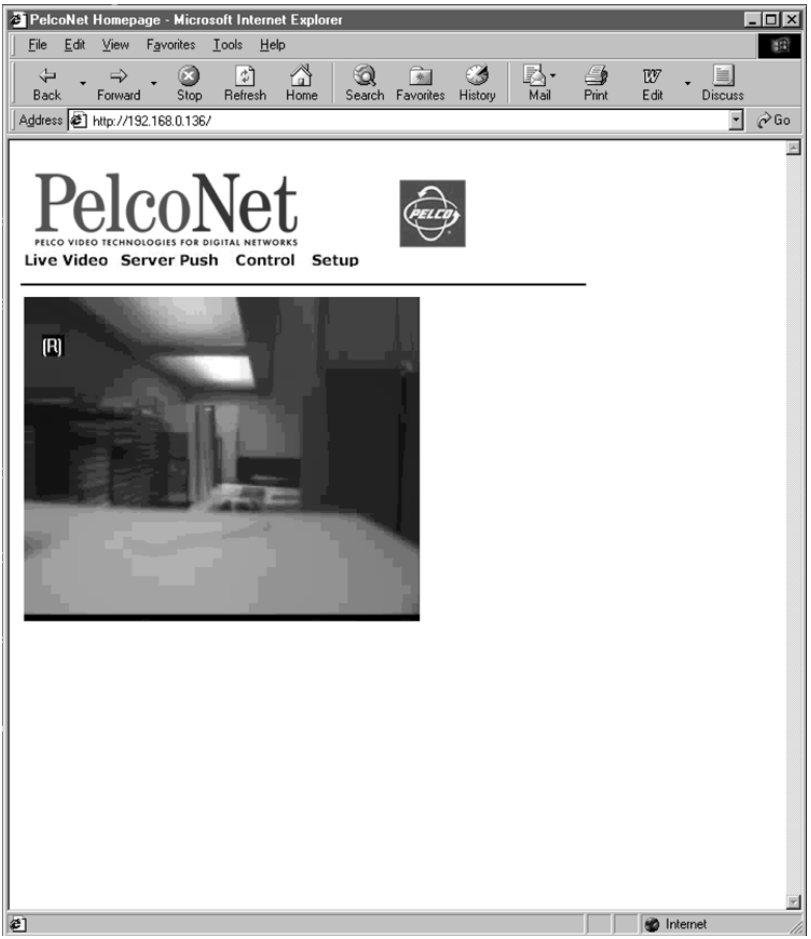

PelcoNet Homepage - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss
Address http://192.168.0.136/
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Internet

Figure 24. PelcoNet Home Page

The home page is the starting point for any configuration.

The window in the center of the screen is the display area for decoded video. See the *Typical Applications* section for a description of how to display video with your browser.

- Clicking on the Pelco logo on any page connects you to the Pelco Internet home page (provided the LAN supports Internet access).
- Click on **Live Video** to choose a live display or **Server Push** for periodically updated stills.
- Click on **Control** to access an options screen with links to pages where you can see and control the displayed view. (Refer to the *Web Browser Control Pages* section.)
- Click on **Setup** to access an options screen with links to configuration pages. Click on any icon on the side to transfer to the desired page.

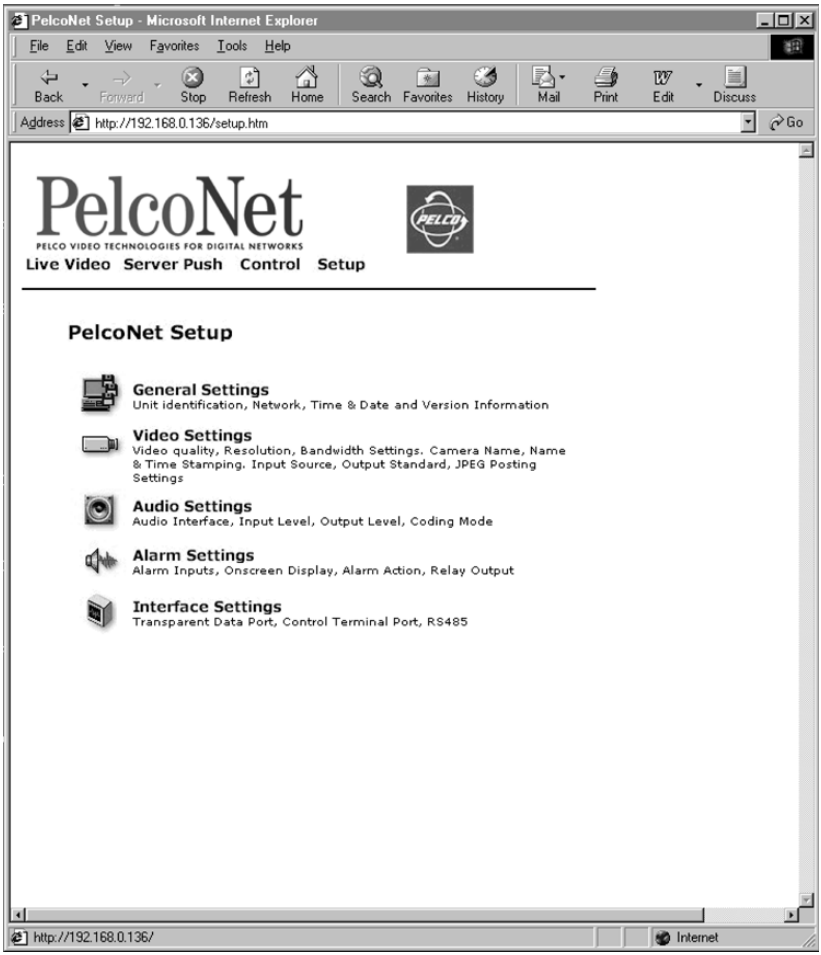

PelcoNet Setup - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss
Address http://192.168.0.136/setup.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
PelcoNet Setup
General Settings
Unit identification, Network, Time & Date and Version Information
Video Settings
Video quality, Resolution, Bandwidth Settings. Camera Name, Name & Time Stamping. Input Source, Output Standard, JPEG Posting Settings
Audio Settings
Audio Interface, Input Level, Output Level, Coding Mode
Alarm Settings
Alarm Inputs, Onscreen Display, Alarm Action, Relay Output
Interface Settings
Transparent Data Port, Control Terminal Port, RS485
http://192.168.0.136/
Internet

Figure 25. PelcoNet Transmission System Setup Page

NOTE: *When changing any configuration item in one of the following pages, make sure to change a single item at a time. Then click the respective Set button. If more than one item needs to be changed, execute the procedure repeatedly. If more than one item is changed without clicking the Set button in between, only the entry associated with the clicked button is actually changed. All other entries return to their previous settings.*

All configuration items are stored in non-volatile memory so they are kept when the unit is not powered up.

Some configurations apply only to transmitters (for example, camera settings) while others apply only to receivers. Also, the audio settings require a unit with the audio option. All settings not expressly restricted to certain models apply to all.

General Settings Configuration Page

The unit ID name and address, as well as network and routing information, comprise the General Settings Configuration Page.

All units have a real-time clock set during manufacture. However, time and date can be changed any time; for example, when the units are operated in different time zones.

Version numbers for the hardware and the firmware are for information only. Whenever you need technical support, make sure you have these numbers ready.

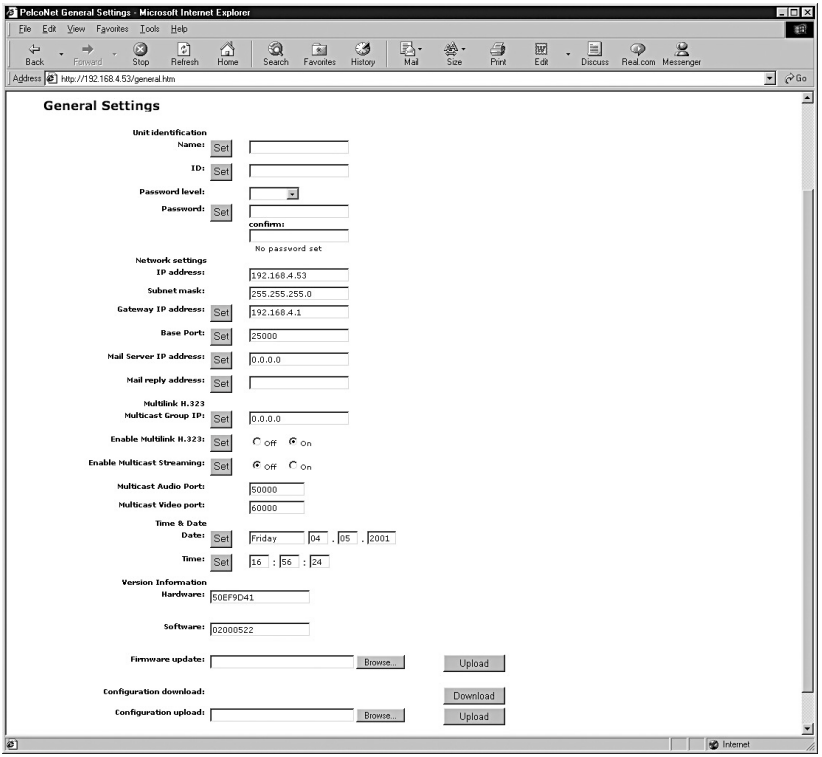


Figure 26. General Settings Configuration Menu

The following table gives detailed information about the items on the General Settings Configuration Page, together with the default factory settings:

Table B. General Settings

Configuration Item	Default Settings	Description
Name	none	The unit name helps the user identify a particular unit, especially if many PelcoNet Transmission Systems are on the network.
ID	none	The ID serves as a machine-readable name. The ID can be read at any time. Reading is facilitated remotely via UDP/IP, letting a management system monitor the unit.
Password level	none	This field lets you set the password at either the user or service level.
Password	none	The unit can be password-protected to prevent unauthorized tampering with the configuration. The password needs to be repeated correctly in the confirm box before password protection is activated. Once password protection is enabled, you need to log in before the configuration pages can be accessed (Figure 27).
IP address	192.168.0.1 (192.168.0.2 for receiver)	Enter a unique IP address that is valid for your network. The pre-configured default IP address allows for easy configuration in closed environments. You can use a crossed cable to directly connect to a PC. Also, the PC's IP address and subnet mask must match the default IP address. ***NOTE:*** *Changing the IP address also affects the current browser connection. You will have to enter the new URL to regain connectivity to the unit.*
Subnet mask	255.255.255.0	Exchange with a valid subnet mask for your network, if subnets are in use.
Gateway IP	none	The IP address of the router. Typically used in a WAN environment.
Base Port	25000	This setting lets the user designate which TCP/IP ports PelcoNet uses for transmission, video, audio, and control. For example, the default setting of 25000 means PelcoNet will use TCP ports 25000-25001 and UDP ports 25002-25011 (12 ports total) for all video and control data.
Mail server IP address	none	Only required if the mail-sending feature is to be used. Outgoing e-mail is sent to the mail server (SMTP server) at the given IP address.

(Continued on next page)

Table B. General Settings (continued)

Configuration Item	Default Settings	Description
Mail reply address	none	Similar to the name field. The recipient of the e-mail will identify the sender of the e-mail by this entry.
Multicast Group IP	0.0.0.0	This is the Multicast IP Address. (Network hard–ware–such as switches, hubs, routers, etc.–must support the multicasting protocol, ICMP.) This field sets PelcoNet to use the multicasting protocol, which makes for a more efficient use of bandwidth.
Enable Multlink H.323	off	When set to “on,” this setting allows the PelcoNet unit to support five simultaneous live video connections.
Enable Multicast Streaming	off	This setting, in conjunction with the two previous settings, can allow an unlimited number of live video connections. The Enable Multilink H.323 field, as well as this field, must both be set “on” for this to work.
Multicast Audio Port	50000	This setting designates the TCP/IP port PelcoNet uses for audio when using the multicasting protocol.
Multicast Video Port	60000	This setting designates the TCP/IP port PelcoNet uses for video when using the multicasting protocol.
Date	n/a	System date, driven by the internal real-time clock. The day-of-week need not be entered and will be automatically adjusted based on the given date.
Time	n/a	System time, driven by the internal real-time clock.
Hardware	n/a	Read-only version number of the hardware. Con-tains unique serial number, type of hardware, and revision.
Software	n/a	Read-only firmware version number. Important infor-mation should you need technical support.
Firmware update	n/a	Enter the name of the file containing new firmware; clicking the upload button will upload the firmware and install it on the system.
Configuration download	n/a	For saving the current configuration of the PelcoNet Transmission System to a PC file.
Configuration upload	n/a	Reverse operation. The configuration can be overwritten by the configuration stored in the named file.

When password protection is on, as described in Table B, the program will display the following password screen if any attempt is made to configure the unit (that is, selecting one of the configuration pages).

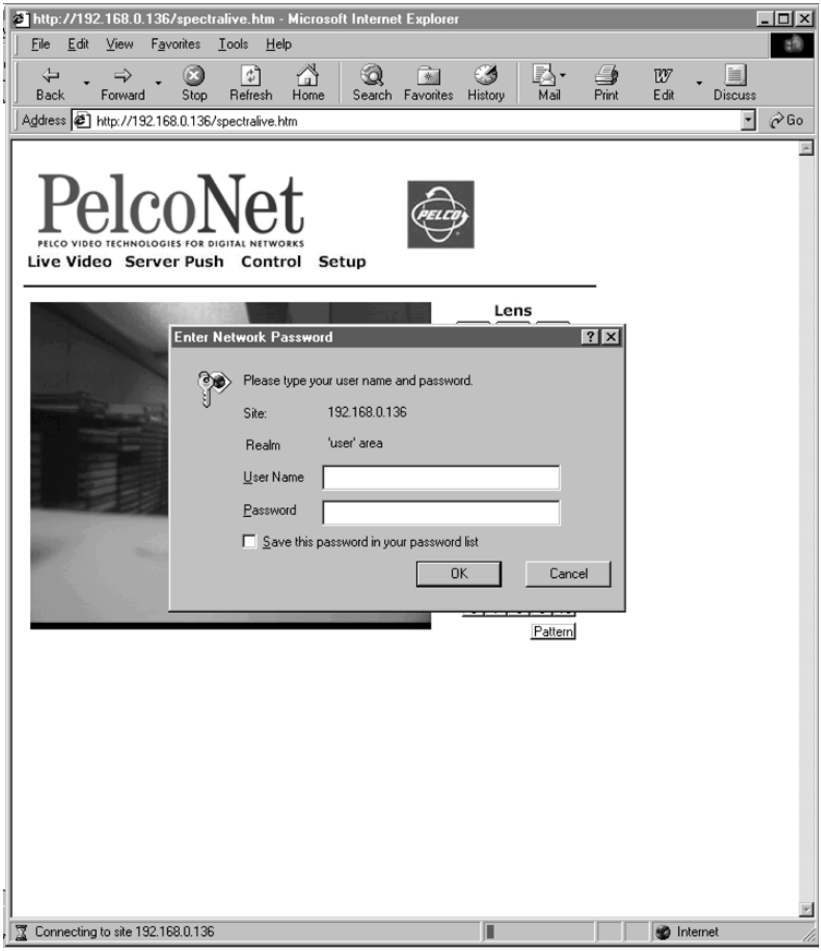


Figure 27. Screen For Entering The Password

Video Settings Configuration Page

The Video Settings Configuration Page lets you modify all video-related parameters. Some items apply only to transmitters while others require a receiver. The screen capture below belongs to a receiver: the setting for the video bandwidth and the output standard are both disabled.

Refer to Table C for default settings and descriptions.

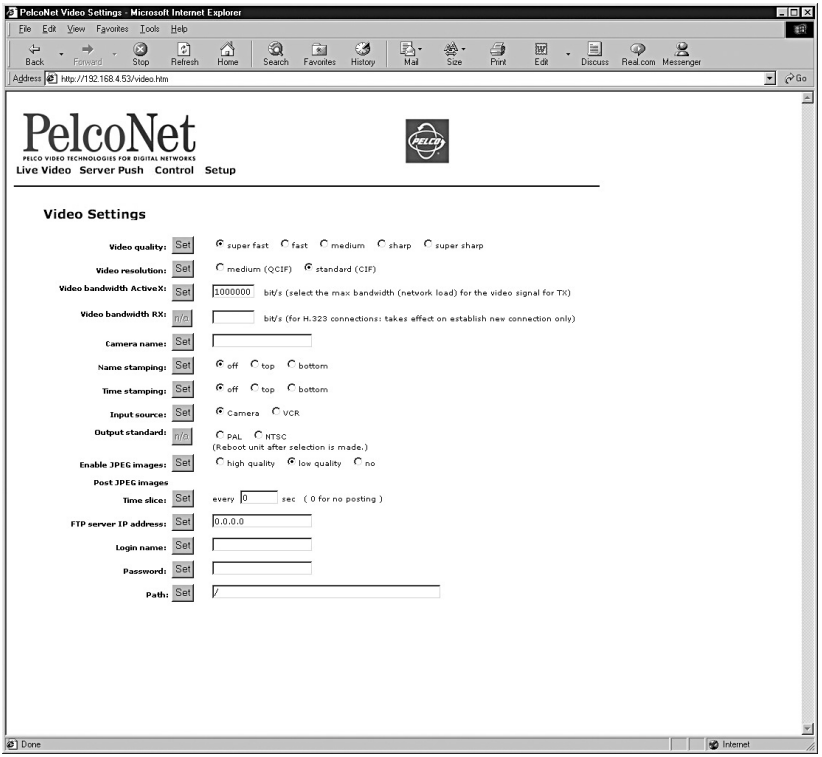

PelcoNet Video Settings - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Size Print Edit Discuss Real.com Messenger
Address http://192.168.4.53/video.htm
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Video Settings
Video quality: Set super fast fast medium sharp super sharp
Video resolution: Set medium (QCIF) standard (CIF)
Video bandwidth ActiveX: Set 1000000 bit/s (select the max bandwidth (network load) for the video signal for TX)
Video bandwidth RX: n/a bit/s (for H.323 connections: takes effect on establish new connection only)
Camera name: Set
Name stamping: Set off top bottom
Time stamping: Set off top bottom
Input source: Set Camera VCR
Output standard: n/a PAL NTSC
(Reboot unit after selection is made.)
Enable JPEG images: Set high quality low quality no
Post JPEG images
Time slice: Set every 0 sec (0 for no posting)
FTP server IP address: Set 0.0.0.0
Login name: Set
Password: Set
Path: Set /
Done
Internet

Figure 28. Video Settings Configuration Menu

The following table details the configuration items. The Type column shows whether the particular setting applies to transmitters (T) or receivers (R), or both (B).

Table C. Video Settings

Configuration Item	Default Settings	Type	Description
Video quality	super fast	T	On restricted bandwidth channels, the video quality preference in terms of speed versus sharpness can be selected. With increasing bandwidth, the effect of this setting diminishes, as best quality and fast motion can be maintained simultaneously.
Video resolution	standard (CIF)	T	Standard video resolution is Common Intermediate Format (CIF) at 352 x 288 picture elements. For very restricted channels (for example, wireless or low speed modem transmission) it may be advantageous to switch to medium resolution (QCIF) at 176 x 144 pixels for decent frame rates.
Video bandwidth ActiveX	250000	T	This field controls the transmitter bandwidth setting for live video.
Video bandwidth RX	250000	R	The transmission rate (that is, the video bandwidth) is controlled from the receiving end. Therefore, this setting only applies to receivers. The data range can be entered from 10 Kbps up to 1 Mbps.
Camera name	none	T	In addition to the unit name, the camera name helps the user identify the location or the visible scene.
Name stamping	off	T	The unit name, as well as the camera name, can be stamped into the video frame. There is a choice of upper or lower left corner for displaying the name information inside the video frame.
Time stamping	off	T	Similar to the name stamping, date and time information can be stamped into the live video frame at either the upper or lower right corner. The stamping occurs at the transmitter before the actual coding takes place. Therefore, the name and the date/time information are an integral part of the coded and transmitted data.

(Continued on next page)

Table C. Video Settings (continued)

Input source	camera	T	To facilitate the connection of video tape recorders as video sources, the input can be switched from the default camera position to VCR. VCRs require a less rigid setting of the internal PLL, due to jitter caused by the mechanical components.
Output standard	PAL	R	The video standard to be used at the output of receivers can be selected to be PAL or NTSC compatible. Transmitters automatically adapt to the standard of the connected video source.
Enable JPEG images	low quality	T	This field must be enabled (activated) for the system to take a snapshot of the camera view. Choose either “high quality” or “low quality” to enable. The next five fields are all settings to control this snapshot.
Time slice	0	T	Enter the number of seconds that a new JPEG should be displayed.
FTP server IP address	0.0.0.0	T	Enter the address used to connect to the FTP server.
Login name	n/a	T	Enter the login name used to access the FTP server.
Password	n/a	T	Enter the password for the login name.
Path	n/a	T	Enter the directory to start in, once connected to the FTP server.

Audio Settings Configuration Page

Audio configuration settings apply only to transmitters and receivers equipped with the audio option (NET101T-A and NET101R-A).

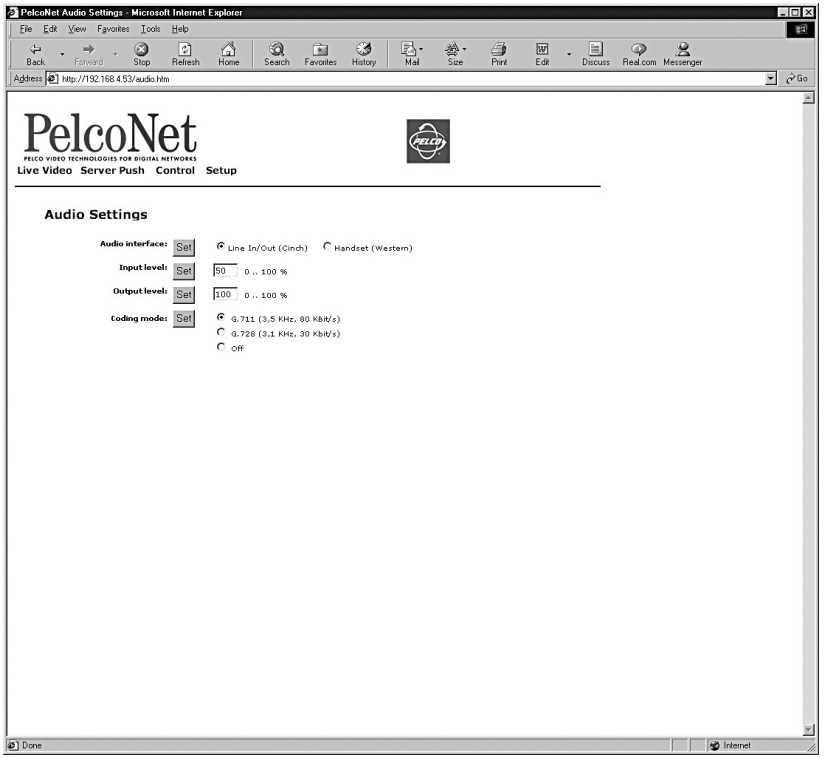

PelcoNet Audio Settings - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Size Print Edit Discuss Real.com Messenger
Address http://192.168.4.53/audio.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Audio Settings
Audio interface: Set Line In/Out (Cinch) Handset (Western)
Input level: Set 50 0 .. 100 %
Output level: Set 100 0 .. 100 %
Coding mode: Set G.711 (3,5 KHz, 80 KBit/s)
G.728 (3,1 KHz, 30 KBit/s)
Off
Done
Internet

Figure 29. Audio Settings Configuration Menu

The table below details available configuration items.

Table D. Audio Settings

Configuration Item	Default Settings	Description
Audio interface	Line I/O	The unit features two different audio interfaces: line input and output via cinch sockets and a telephone handset interface via an RJ-11 plug. The handset interface also features DC power for the microphone. Only one of the interfaces is active at any given time, as selected by this setting.
Input level	25%	The sensitivity of the input needs to be adapted to the level of the audio source to avoid oversteering and the resulting distortions. Experiment for the best setting.
Output level	12%	Adapt the output level to the requirements of connected audio equipment.
Coding mode	off	The audio function is switched on by selecting any of the two different coding algorithms, G.711 or G.728. The tradeoff is given on the web page: G.711 is the preferred operation if bandwidth is not a concern. G.728 greatly improves efficiency at a somewhat reduced audio quality.

Alarm Settings Configuration Page

The PelcoNet Transmission System is not only a multimedia gateway but also a security device and, therefore, has many features related to security applications. The Alarm Settings Configuration Page lets you configure your unit for video surveillance applications. This page basically applies to transmitters only. However, receivers do provide the same features. In most surveillance-related applications, the receiver is located in a secure alarm center-type environment while the transmitter is mounted inside or at the location to be monitored. See the *Typical Applications* section for more information about remote video surveillance.

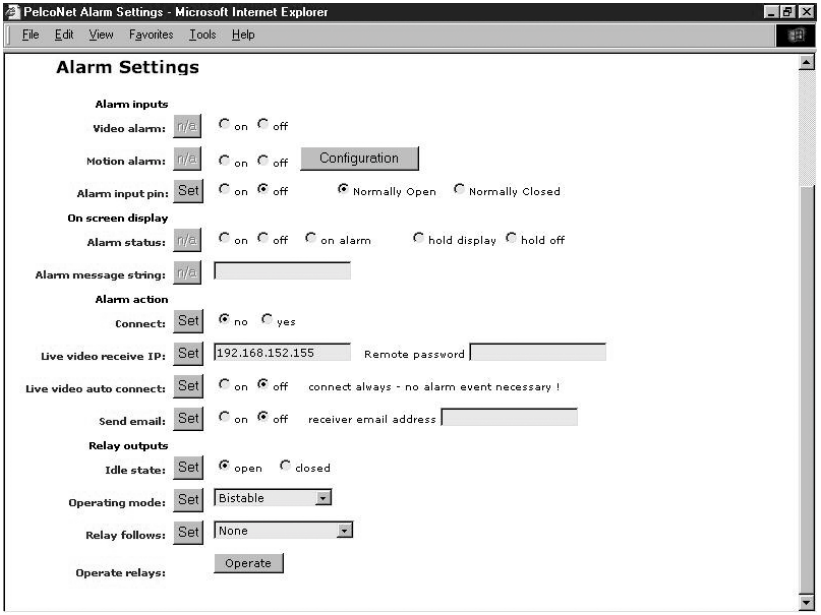

PelcoNet Alarm Settings - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Alarm Settings
Alarm inputs
Video alarm: n/a on off
Motion alarm: n/a on off Configuration
Alarm input pin: Set on off Normally Open Normally Closed
On screen display
Alarm status: n/a on off on alarm hold display hold off
Alarm message string: n/a
Alarm action
Connect: Set no yes
Live video receive IP: Set 192.168.152.155 Remote password
Live video auto connect: Set on off connect always - no alarm event necessary !
Send email: Set on off receiver email address
Relay outputs
Idle state: Set open closed
Operating mode: Set Bistable
Relay follows: Set None
Operate relays: Operate

Figure 30. Alarm Settings Configuration Menu

The set of video surveillance features is explained below.

Table E. Alarm Settings

Configuration Item	Default Settings	Description
Video alarm	off	The signal video source (the camera in most cases) is constantly checking for availability. Should the video signal fail—due to tampering or failure of the camera or video cable—an alarm action may be triggered, if selected, as explained below.
Motion alarm	off	The system has a video motion detection feature. The video scene is constantly monitored for relevant motion. Click the Configuration button to access a camera view overlaid with a grid. Select the cells you want the system to monitor for motion. Click the Select All button in the Select Sensor Fields box to select all cells (which will turn red). To set an individual cell, click on it with the left mouse button. Click with the right mouse button to deselect a cell (which will turn white). Select or deselect multiple cells by holding down the left or right mouse button and dragging. Release when finished. Press the Clear All button in the Select Sensor Fields box to deselect all cells. Set sensitivity using the arrows in the Sensitivity box, or drag the square button on the bar between Low and High. The following conditions must be met for motion detection to function: • Motion detection must be activated. • At least one cell must be activated. • Sensitivity must be set higher than zero. The sensitivity needs to be adapted to the respective environment and the acceptable false alarm rate: for a lower false alarm rate select a lower sensitivity and vice versa. Some experimentation is required to find the best setting. Use of the motion detection feature is only recommended indoors and under controlled lighting conditions.
Alarm input pin	off	If external sensors or simple contacts or switches will be used with the system, you need to turn on the alarm input. You also must select whether the input is normally open or normally closed.

(Continued on next page)

Table E. Alarm Settings (Continued)

Configuration Item	Default Settings	Description
Alarm status	off	Current alarm activation status can be shown in the video frame (similar to the name, date, and time stamping discussed in Table C). If configured to be on, the status of the activated alarms, namely video, motion and input, is shown in the upper left corner of the video frame. Or, the display can be activated as soon as an alarm condition is reached. This way, the video frame corresponding to the alarm condition is clearly marked. Also, there is a choice to keep the status display, once an alarm has been triggered, even when the original cause of the alarm is no longer present, or to have the status display follow the alarm condition.
Alarm message string	empty	In connection with the alarm status explained above, a user-defined text string can be displayed on the screen in the upper right corner. The text string is typically used to convey additional alarm-related information to the remote viewer (a guard, for example).
Connect	off	The alarm functions would have little effect without automatically triggering corresponding actions. The current setting allows for an automatic connection establishment to the given IP address. The idea is to provide a remote monitoring station with live video in case of an alarm. This feature can be useful even for many applications not related to alarm conditions. One example is a video-equipped door entry system: when the doorbell is pressed, a contact closes and the connected transmitter autonomously connects to a receiver. Full duplex audio can provide verbal communication, while the relay output can remotely open the door. On receivers, the default alarm connection IP address is set to 192.168.0.1 (default IP of transmitter).
Live video receive IP	0.0.0.0	Enter the IP address of the transmitter or receiver for live/alarm connection. If that remote unit has a password, enter it in the Remote Password field so the two units can communicate with each other.

(Continued on next page)

Table E. Alarm Settings (Continued)

Configuration Item	Default Settings	Description
Live video auto connect	off	The auto connect feature guarantees an active connection to the given alarm IP address even after connection breakdown or network failures. If auto connect is selected, the network cable can be pulled any time. As soon as the network comes back alive, the connection is reinstated. On a receiver, this feature is enabled to establish a connection to a transmitter automatically.
Send email	off	Alarm conditions can also be documented by e-mail. When triggered, an e-mail message with attached JPEG-encoded video frame is sent to the given e-mail recipient.
Idle state	open	The output contacts of the built-in relay are configured to be either closed or open when the relay is idle.
Operating mode	bistable	When the default bistable mode is selected, the relay will stay in the idle or active state for an indefinite period. In the monostable operation mode, the relay will automatically fall back to the idle state after a predefined period expires.
Relay follows	none	Operation of the relay can also be automated. Selecting any entry from the list ties the operation of the relay to the respective action or condition. A typical application is having the relay following the status of the connection; for example, to power peripheral equipment or even the camera itself.
Operate relays	n/a	Clicking the button operates the relay. Typical applications are opening remote doors or operating lights.

Interface Settings Configuration Page

You can use the Interface Settings Configuration Page to configure the parameters of the RS-232 transparent data port on the front panel. The parameters of the terminal port are configured at 9600 baud, 8 data bits, no parity, and 1 stop bit.

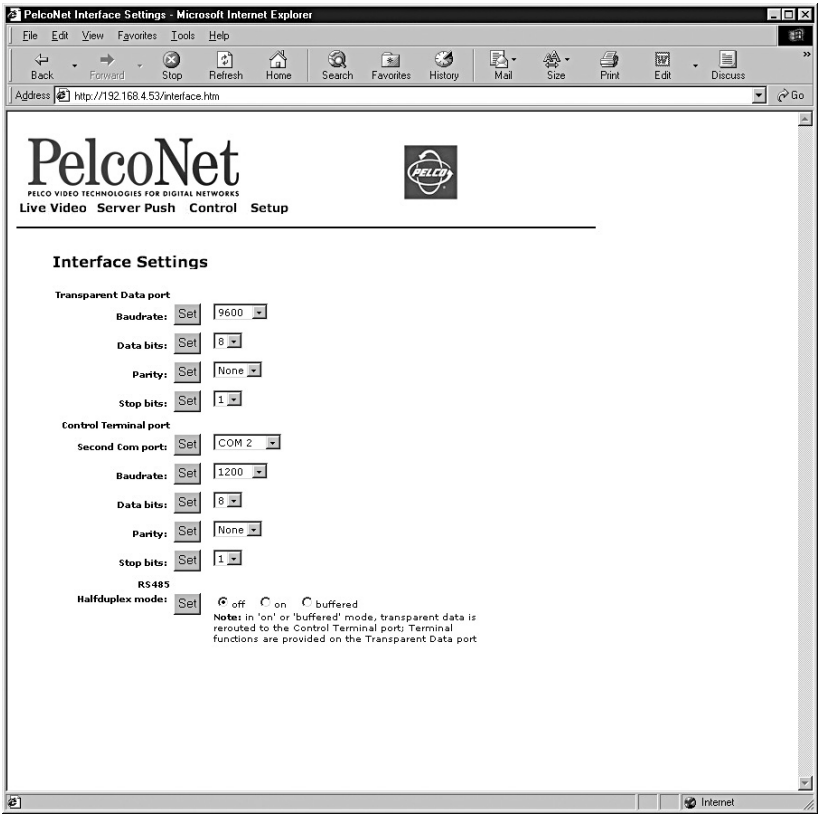

PelcoNet Interface Settings - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Size Print Edit Discuss
Address http://192.168.4.53/interface.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Interface Settings
Transparent Data port
Baudrate: Set 9600
Data bits: Set 8
Parity: Set None
Stop bits: Set 1
Control Terminal port
Second Com port: Set COM 2
Baudrate: Set 1200
Data bits: Set 8
Parity: Set None
Stop bits: Set 1
RS485
Halfduplex mode: Set off on buffered
Note: in 'on' or 'buffered' mode, transparent data is rerouted to the Control Terminal port; Terminal functions are provided on the Transparent Data port
Internet

Figure 31. Interface Settings Configuration Menu

The default parameters of the transparent data port agree with the most commonly used settings, as shown in the following table.

Table F. Interface Settings

Configuration Item	Default Settings	Description
Transparent Data Port		
Baudrate	9600	Select any transmission rate from 300 to 19200 baud.
Data bits	8	Select 7 or 8 data bits.
Parity	none	Select odd, even, or none.
Stop bits	1	Select 1 or 2 stop bits.
Control Terminal Port		
Second com port	Terminal	The second COM port (Control Terminal port) can be set to use Terminal mode, which is used to program the unit through HyperTerminal. Or, it can be set to "COM 2," which will allow control of devices such as a digital video recorder (DVR) or pan/tilt/zoom camera, etc. As such, it functions just like the Transparent Data port, thus providing two control ports. However, when set to "COM 2" PelcoNet can no longer be accessed through HyperTerminal.
Baudrate	19200	Select any transmission rate from 300 to 19200 baud.
Data bits	8	Select 7 or 8 data bits.
Parity	none	Select odd, even, or none.
Stop bits	1	Select 1 or 2 stop bits.
RS485		
Halfduplex mode	off	If this RS-485 mode is chosen, the camera control data is transferred automatically to the control terminal port, which is a serial interface on the rear panel of the unit to which a PC can be hooked. This mode supports flow control.

NOTE: *In the "on" or "buffered" mode, transparent data is rerouted to the control terminal port; terminal functions are provided on the transparent data port.*

LIVE VIDEO AND SERVER PUSH VIDEO PAGES

The Live Video page shows a real-time picture of the camera view with update rates and image quality similar to a box-to-box configuration. It can be configured for bandwidth use and for various image quality settings. The Server Push page shows still pictures that are updated periodically, and image quality is fixed.

1. To access the PelcoNet Transmission System home page, you must first connect to the Internet/ intranet network and open Internet Explorer (the browser).

2. Then, enter the default address **192.168.0.1** in the address box. If this address has been changed, enter the appropriate address. The home page appears.

3. Click on either **Live Video** or **Server Push** on the home page.

To exit either page, click on an option at the top of the page.

The program displays dialog boxes when you try to view live video under any of the following conditions:

- With a browser other than Internet Explorer.

- Without first installing ActiveX (Figure 32).

- When your computer display is not set for 16-bit color (Figure 33). (To change: double-click on **My Computer**, **Control Panel**, **Display**, the **Settings** tab, and select **High Color [16 bit]**. For NT, select **65536 Colors**.)

With any of these conditions, you can only view the video as a series of still images.

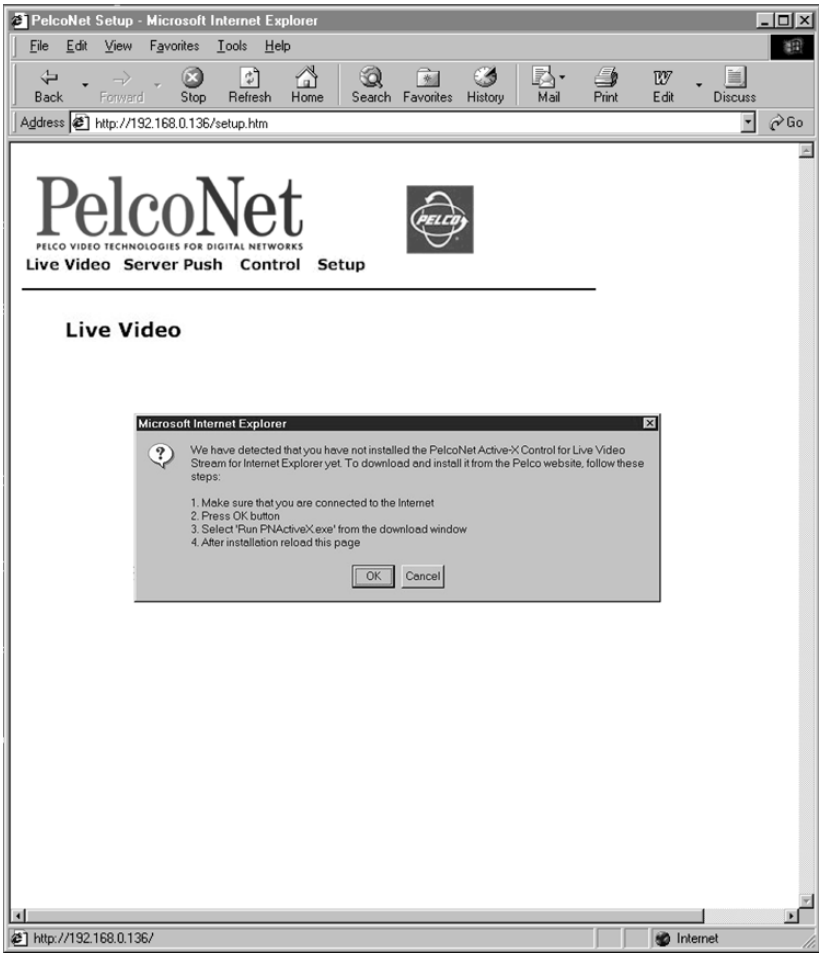

PelcoNet Setup - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss
Address http://192.168.0.136/setup.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Live Video
Microsoft Internet Explorer
We have detected that you have not installed the PelcoNet Active-X Control for Live Video Stream for Internet Explorer yet. To download and install it from the Pelco website, follow these steps:
1. Make sure that you are connected to the Internet
2. Press OK button
3. Select 'Run PNActiveX.exe' from the download window
4. After installation reload this page
OK
Cancel
http://192.168.0.136/
Internet

Figure 32. ActiveX Dialog Box

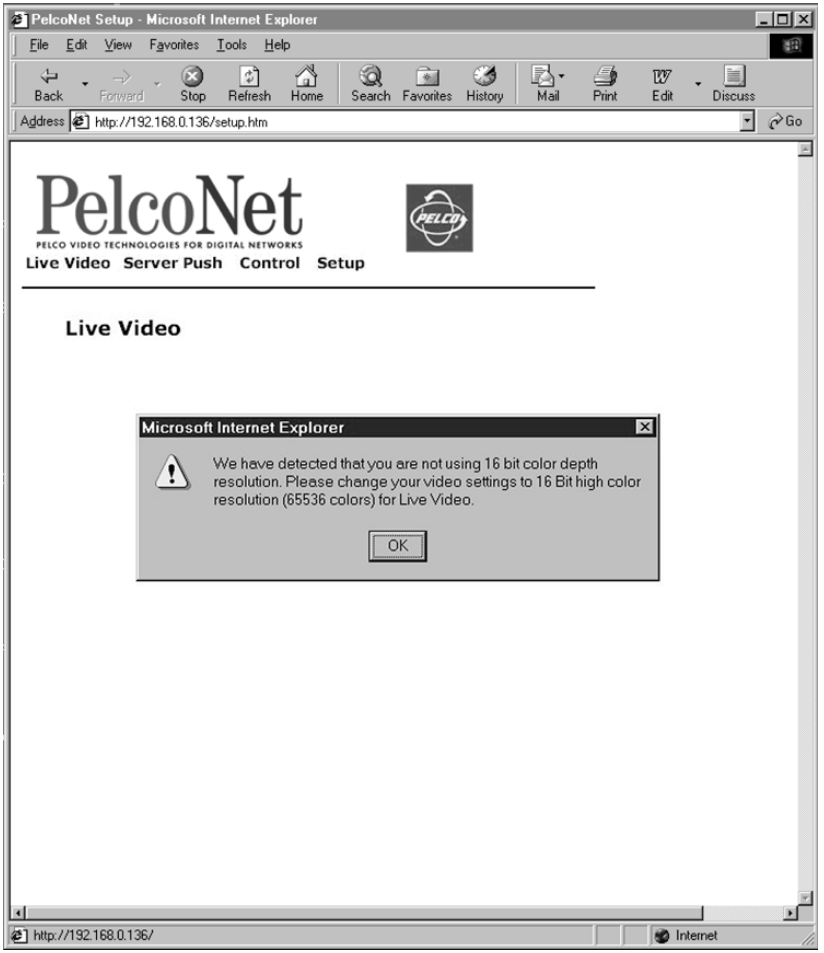

PelcoNet Setup - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss
Address http://192.168.0.136/setup.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Live Video
Microsoft Internet Explorer
We have detected that you are not using 16 bit color depth resolution. Please change your video settings to 16 Bit high color resolution (65536 colors) for Live Video.
OK
http://192.168.0.136/
Internet

Figure 33. Color Setting Dialog Box

WEB BROWSER CONTROL PAGES

Accessing These Pages

1. To access the PelcoNet Transmission System home page, you must first connect to the Internet/intranet network and open Internet Explorer (the browser).

2. Then, enter the default address **192.168.0.1** in the address box. If this address has been changed, enter the appropriate address.

3. On the home page, click on **Control** to access the Device Controls page.

4. The Device Controls page has underlined links to the control pages. To access, click on one.

NOTE: *The DX3016 control pages apply to both the DX3009 and DX3016.*

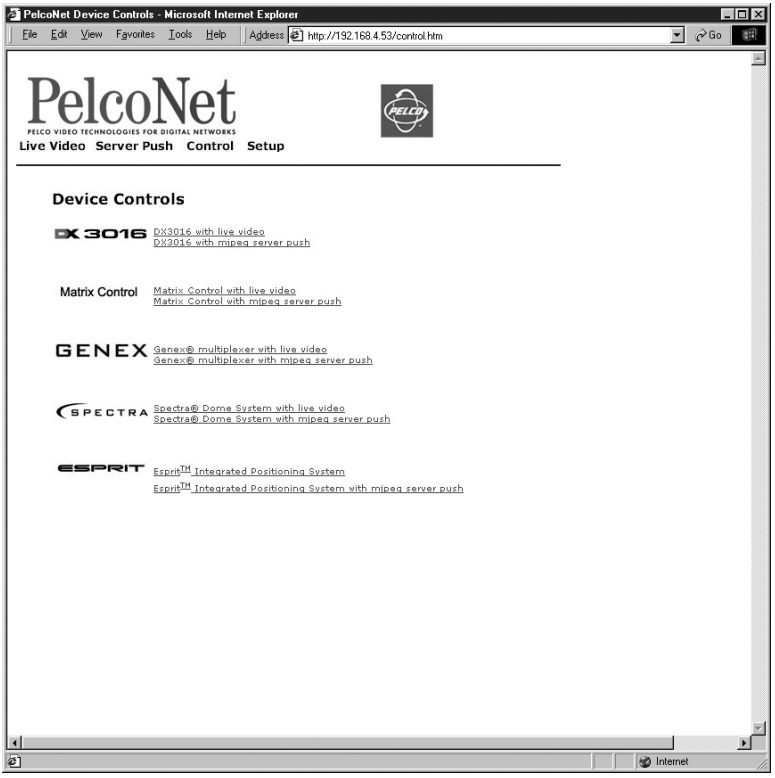


Figure 34. Device Controls Page

Controlling The Display

The live video control pages include representations of keys that let you control various functions (in addition to showing the camera display). Use the mouse pointer and click the left mouse button to enable options and operate controls on the screen. Click outside the options to disable a radio button or selection button.

Live video pages let you choose the size of the video viewing area. Click either 352x288 (small) or 704x576 (large) in the Resize Video field.

Live video pages also let you record and play back camera views on a PC's hard drive. Refer to the *Record and Play Back the Display on a PC* section for details.

On the Spectra and Esprit live video control pages, you can control the following:

- **Presets**–To program a preset: position the camera, click the **Set** checkbox, and click a preset number button.

  To activate a preset: click a preset number button.

- **Patterns**–You can program only one pattern through PelcoNet. To program a pattern: click the **Set** checkbox, then click **Start**., and use the arrow buttons to position the camera. Click **Stop** to halt pattern programming.

  To operate a pattern: click **Start** to begin the pattern and **Stop** to halt.

- **Programming Menus**–To access the programming menus: click the **Set** checkbox, and click the **95** button. Use the camera arrow keys to move up/down the menus. Use the open iris icon to open menus and set options. Use the open iris icon in conjunction with the Exit option to move backward through menu layers and to exit programming mode.

***NOTE*:** *If you installed Internet Explorer from the PelcoNet Transmission System CD, ActiveX is already installed. Otherwise, you must install ActiveX before you can view the video. Refer to the* Instructions For The Network Administrator *section.*

Matrix Control Live Video/Server Push Page Contents

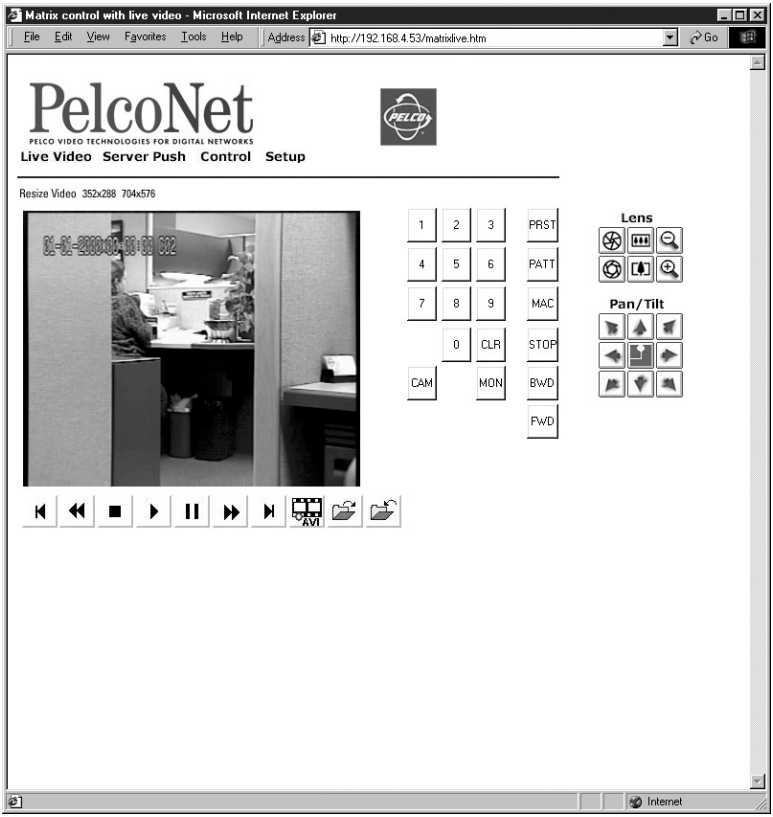


Figure 35. Matrix Control Page

The Matrix Control pages contain the following:

- Ten numbered buttons
- CLR (clear) button
- CAM (camera) button
- MON (monitor) button
- PRST (preset) button
- PATT (pattern) button
- MAC (macro) button
- STOP button
- BWD (backward) button
- FWD (forward) button
- PC hard drive record/playback control buttons beneath the live screen (refer to the *Record and Play Back the Display on a PC* section for more information)

The following are arrayed under “Lens”:

- Iris open and close buttons
- Focus far and near buttons
- Zoom out and zoom in buttons

The following are arrayed under “Pan/Tilt”:

- Eight direction arrow buttons
- Home button in the center

Genex Live Video/Server Push Page Contents

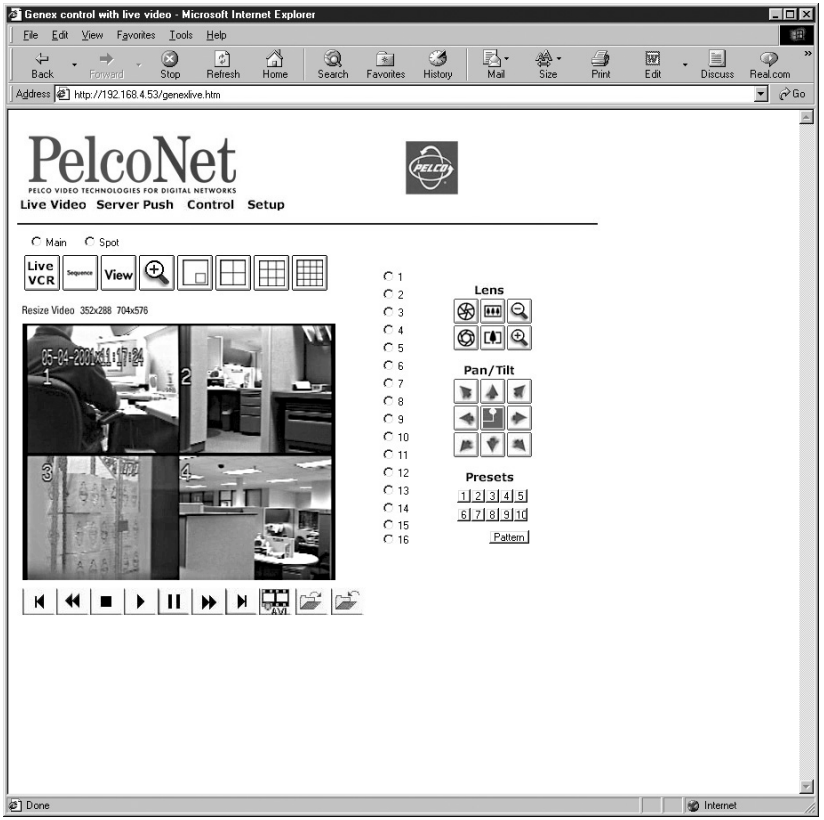

Genex control with live video - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Size Print Edit Discuss Real.com
Address http://192.168.4.53/genexlive.htm
Go
PelcoNet
PELCO VIDEO TECHNOLOGIES FOR DIGITAL NETWORKS
Live Video Server Push Control Setup
Main Spot
Live VCR
Sequence
View
Resize Video 352x288 704x576
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Lens
Pan/Tilt
Presets
1 2 3 4 5
6 7 8 9 10
Pattern
Done
Internet

Figure 36. Genex Control Page

The Genex pages contain the following across the top of the page:

- Main and spot monitor selection radio buttons
- A Live/VCR button
- A Sequence button
- A View button
- A zoom out button
- A picture-in-picture button
- Buttons for 4-, 9-, and 16-screen display

The following are arrayed down the right side of the page:

- Radio buttons for 16 cameras
- Iris open and close buttons
- Focus far and near buttons
- Zoom in and zoom out buttons
- Eight direction arrow buttons with a home button in the center
- Ten numbered buttons to use with the Pattern button (enter preset number and click Pattern)
- A Pattern button

PC hard drive record/playback control buttons are arrayed beneath the live screen (refer to the *Record and Play Back the Display on a PC* section for more information).

Spectra Live Video/Server Push Page Contents

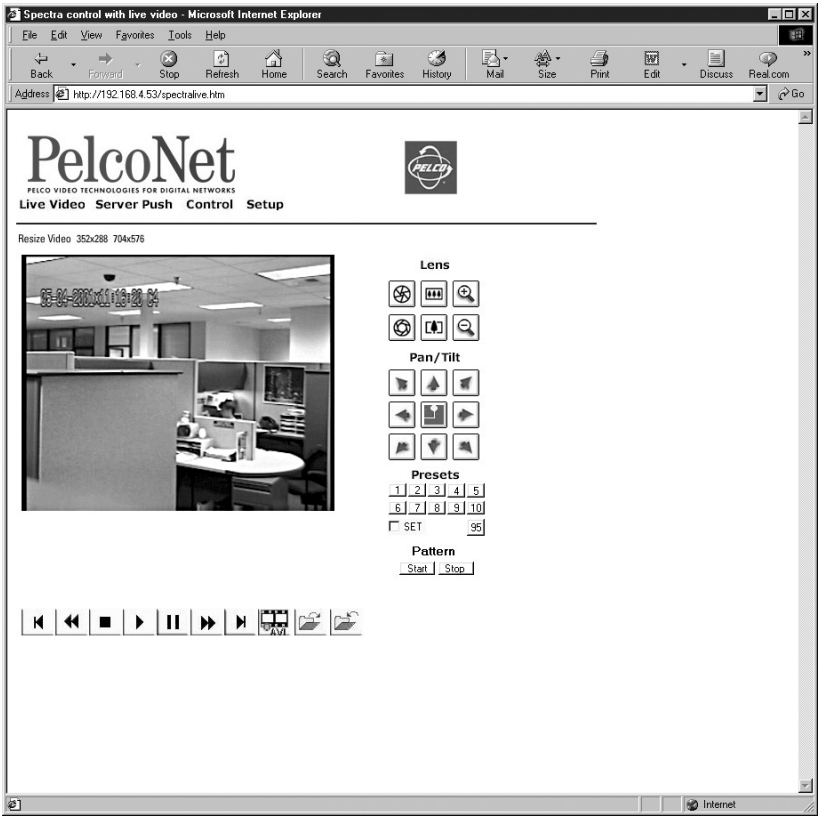


Figure 37. Spectra Control Page

The Spectra pages contain the following arrayed down the right side under “Lens”:

- Iris open and close buttons
- Focus far and near buttons
- Zoom out and zoom in buttons

The following are arrayed under “Pan/Tilt”:

- Eight direction arrow buttons
- Home button in the center

The following are arrayed under “Presets”:

- Ten numbered preset buttons
- A Set checkbox
- A preset 95 button for entering the programming menus

The following are arrayed under “Pattern”:

- A Start pattern button
- A Stop pattern button

PC hard drive record/playback control buttons are arrayed beneath the live screen (refer to the *Record and Play Back the Display on a PC* section for more information).

Esprit Live Video/Server Push Page Contents

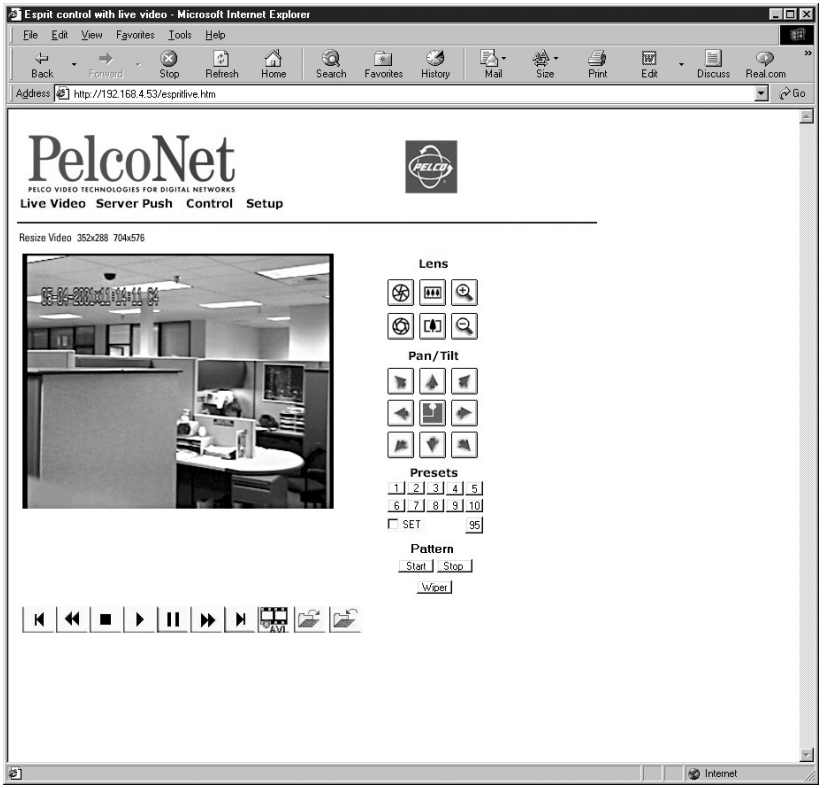


Figure 38. Esprit Control Page

The Esprit pages contain the following arrayed down the right side under “Lens”:

- Iris open and close buttons
- Focus far and near buttons
- Zoom out and zoom in buttons

The following are arrayed under “Pan/Tilt”:

- Eight direction arrow buttons
- Home button in the center

The following are arrayed under “Presets”:

- Ten numbered preset buttons
- A Set checkbox
- A preset 95 button for entering the programming menus

The following are arrayed under “Pattern”:

- A Start pattern button
- A Stop pattern button
- A Wiper button

PC hard drive record/playback control buttons are arrayed beneath the live screen (refer to the *Record and Play Back the Display on a PC* section for more information).

DX3016 Live Video/Server Push Control Page Contents

Figure 39. DX3016 Control Page

NOTE: *The DX3016 control pages apply to both the DX3009 and DX3016.*

The DX3016 pages contain the following arrayed across the top:

- "Split" buttons (16-grid, 9-grid, A, B) let you view various camera combinations. "A" displays cameras 1-4, "B" displays cameras 5-8, 9-grid displays cameras 1-9, and 16-grid displays cameras 1-16.
- Two sequence buttons (SEQ, SEQ) run sequences 1 and 2.

Arrayed down the right side are camera buttons 1-16. Click a button to view the associated camera.

The record/playback control buttons for the digital video recorder are arrayed directly beneath the screen. From left to right the icons are defined as follows:

- This green button resets the DVR after a warning is received (for example, if a camera is disconnected). Click this button to reset the unit. Refer to the *DX3000 Warning Reset Button* documentation in the *Troubleshooting* section for a list of the warnings.

- This button reverses the image one frame at a time in playback mode.

- This button reverses the image 3-5 frames at a time in playback mode.

- This button begins playing the recorded video in reverse.

- This button halts recording and playback.

- This button begins playing the recorded video forward.

- This button pauses recording and playback.

- This button advances the image 3-5 frames at a time in playback mode.

- This button advances the image one frame at a time in playback mode.

- This red button starts recording (it turns solid when recording).

Below the DX3016's recording/playback buttons is a row of pull-down menus for setting the date (month, day, year) and time (hour, minute, second) for a search. After setting the date and time, click the Search button to begin the search.

PC hard drive record/playback control buttons are arrayed beneath the search menus on the live control page (refer to the *Record and Play Back the Display on a PC* section for more information).

ADVANCED FEATURES

Automatic Connection Feature

The advantage of conventional dedicated cabling lies in guaranteed performance and availability. The PelcoNet Transmission System's auto-connect feature is designed to provide the same level of guaranteed connectivity expected from analog coaxial video cables.

IT networks commonly experience short breakdowns and congestion. Protocols used for computer communication (for example, TCP/IP) are designed to cope with missing data and interruptions. With the PelcoNet Transmission System, once a video connection is established, the video stream normally terminates gracefully when a network connector is pulled or the network is otherwise disrupted.

The system can be configured to reconnect automatically to guarantee connectivity. To activate this feature, click the Live Video Auto Connect radio button to On (on the Alarm Settings Configuration Page) and confirm this choice by clicking the Set button. Now the unit will try to connect to the specified alarm IP address every time. The receiving station (alarm IP address) can be another receiver.

Video Motion Detection Feature

The transmitter can automatically check video input for significant motion in the scene and trigger an alarm if the motion exceeds a preset threshold. Activate motion detection by setting Motion Alarm to On in the Alarm Settings Configuration Page.

Click the Configuration button to select sensitivity for motion detection. You need to tailor this parameter to the particular application. Experiment to find the best setting. Higher sensitivity may lead to erroneous detection and increase false alarms.

You can restrict motion detection to certain areas in the scene. Select the cells you want the system to monitor for motion. Press the Select All button in the Select Sensor Fields box to select all cells (which will turn red). To set an individual cell, click on it with the left mouse button. Click with the right mouse button to deselect a cell (which will turn white). Select or deselect multiple cells by holding down the left or right mouse button and dragging. Release when finished. Press the Clear All button in the Select Sensor Fields box to deselect all cells.

Set sensitivity using the arrows in the Sensitivity box, or drag the square button on the bar between Low and High.

Alarm Notification By E-mail

The e-mail feature lets you send an e-mail message to a recipient on any alarm event. This could be used to signal an alarm to people who cannot be reached with a video-based notification.

To activate this feature, enable at least one of the alarm inputs, configure a receiver e-mail address, and activate the Send Email button. Remember to configure a mail server and gateway IP addresses in the General Settings Configuration Page.

Now the system will send an e-mail to the specified recipient on every alarm event. There will be a timeout of at least 30 seconds before the same alarm event generates another e-mail message.

The e-mail will contain the status of the three alarm inputs so you can see which event triggered the e-mail (when more than one alarm input is enabled). Every alarm e-mail message includes an attached JPEG-encoded video snapshot taken at the time of the alarm event, documenting the condition.

Record and Play Back The Display On a PC

Live video control pages let you record the camera display on a PC's hard drive and play it back later. The file is recorded on the hard drive of the PC on which you are viewing the picture. The controls are a row of buttons beneath the screen.

- These buttons jump the display to the beginning or ending of the recording in playback mode.

- These buttons incrementally move the display backward and forward while the display is paused in playback mode.

- This button stops the recording or playback.

- This button pauses the recording or playback.

- This button plays the recording.

- This button starts the recording.

- This button is used to designate a location for saving the recording.

- This button is used to load a recorded file for playback.

Recording The Display

Do the following to record the camera display:

1. Access a live video control page (by clicking **Control** on the Home page, and then clicking one of the underlined links to a live video control page).
2. Position the camera as desired.
3. Click the button. The Choose Directory window opens.
4. Select a location in which to save the recording. Click **OK**.
5. Click the button to begin recording.
6. Click the button to halt recording. The recording is saved automatically.

Playing Back The Recording

You can play back the camera recording either through the Windows Media Player or in PelcoNet through the browser. Do the following to play back the camera recording through the browser:

1. Access a live video control page (by clicking **Control** on the Home page, and then clicking one of the underlined links to a live video control page).
2. Click the button. A directory window opens.
3. Select the directory where the file you want is located. Click the file to select it, and then click **Open**.
4. Click the button to begin playback.

   To advance or reverse the playback, first click the button. Each click of a or button moves the recording a few frames. To move to the beginning or end of the recording, click a or button. Click the button to resume playback.
5. Click the button to halt playback and return to live video. You can replay the recording by clicking the button.

Firmware Upload

Units have flash EPROMs for firmware upgrades in the field. These upgrades can be done directly from the web browser.

Do the following to upload firmware using the web browser:

1. Obtain the latest PelcoNet Transmission System firmware from Pelco (http://www.pelco.com).
2. Use the browser to select the General Settings Configuration Page of your unit.
3. Use the Browse button in the Firmware update field to select the correct new firmware file.
4. Click the **Upload** button.
5. After about 30 seconds you should get a feedback message from the connected unit.
6. The message “upload complete – WAIT” confirms the correct upload of the new firmware, which is now being installed. The green LED flashing indicates installation.

   WARNING: *Do not for any reason disconnect power to the unit while firmware is being installed. Disrupting the reprogramming cycle will damage the flash EPROM. If this occurs, you will have to return the unit for repair.*

   The green LED will stop blinking once reprogramming is complete.
7. If you try to upload an invalid firmware file, you will get the message “Upload Failed.”
8. If you revisit the General Settings Configuration Page after the firmware is successfully uploaded, you will see the message “New Firmware Installed.”

TROUBLESHOOTING

If the following instructions fail to solve your problem, contact Pelco Technical Support at 1-800-289-9100 for help. You should have the serial number from the bottom of the unit and the firmware version ready in case they are needed.

Do not try to personally repair a unit. Opening it immediately voids any warranty. Leave maintenance and repairs to qualified technical personnel. Swap a defective unit with a replacement unit and return the defective one for repair.

Basic Functioning

Three LEDs on the unit indicate its condition. The following sections describe malfunctions indicated by the LEDs.

Green Power LED

Green Power LED Is Off

If the green power LED on the front panel is off and you believe it should be on, check the following:

- Make sure the enclosed power supply is connected correctly to the power plug socket.
- Make sure the power supply is connected properly to a functioning power outlet.
- Check the power cord for apparent damage.
- Check the power supply for a 5 VDC output. If it is correctly connected and the green power LED still does not light, exchange the power supply for a new one.

Green Power LED Blinks Slowly

This does not indicate a malfunction but means a connection exists between one unit and another. Connections with a web browser have no effect on this LED, so there will be no blinking light during configuration.

Green Power LED Stays Off After Firmware Upload And Reprogramming

If the power LED does not come back on after a firmware upload, there may have been a problem during upload. Return the system to the dealer.

Closely follow the instructions for the firmware upload. Especially do not disconnect the power supply during firmware upload and reprogramming.

LAN Link LED

The green LAN Link LED next to the Ethernet 10BASE-T connector should light when the Ethernet connection is made. If this LED is off:

- Make sure the network cable is firmly connected to the hub or switch.
- Does the hub or switch work correctly in the network? Check the power supply of the hub or switch.
- Use a Cat5 straight-through cable to connect to a normal hub. Check the cable for physical damage.
- Use a crossover cable if connecting a unit directly to a PC without a hub.

Transmit LED

The orange LED next to the Ethernet 10BASE-T connector should flash briefly whenever a unit transmits a packet (for example, when accessing the unit with a web browser). If this LED fails to come on, perform the following checks:

- Are all units connected correctly with the power supply? Check power supplies and connections.
- Did you configure the correct IP address for your unit?
- Is your web browser configuration correct?
- Is the TCP/IP protocol installed on your PC operating system, and is an IP address assigned to the PC?
- Are the subnet mask and gateway properly set up?

Contact your network administrator if you have problems installing your network.

Terminal Program

If the terminal program fails to connect to the unit's terminal port, check the following:

- Is the right COM-port interface on the PC selected for the terminal program, and are the settings correct? Is the cable connected to the terminal and **not** the data port on the unit? Program default settings are 19200 kb/s, 8 data bits, no parity, 1 stop bit (8N1) for the terminal program.

- If the data exchange between the terminal program and the system still does not work, check the serial cable. Does the system answer when you enter a question mark?

- Disable the local echo if you see duplicate characters on your screen.

Troubleshooting a TCP/IP Network Using A Ping Utility

(Enter the appropriate information where indicated by the quotation marks below. Do not enter the quotation marks.)

To see if a unit in your network can be reached, try to ping your unit by typing the following command in a DOS window:

c:\>ping 'unit IP address'

If it is reached, there will be a response like the following:

Reply from <IP address>: bytes=32 time=NN ms TTL=xxx

If the LAN path is malfunctioning, the ping command will time out. If so, you could have one of the following problems:

- Wrong physical connections. Make sure the LAN Link LED is on. See the *Basic Functioning* section above for more information.

- Wrong network connection. Verify the IP address is entered correctly and that subnet mask and gateway address are set properly.

Otherwise, ask your network administrator.

Troubleshooting Connection Problems

If you fail to connect to a system from a hardware receiver, check the following to pinpoint the problem:

- Do not connect two units of the same type (for example, receiver to receiver).
- Make sure network connectivity is available (for example, by using the ping command as described above).

Troubleshooting The Video Connection

If no video or a distorted video image is displayed at the receiver during a connection to a transmitter:

- Make sure to use the right unit for your application: a camera can only be connected to a transmitter, never to a receiver.
- Make sure the camera is switched on and the coaxial cable is connected to the transmitter.
- Check the camera cable and connect a video monitor to the camera to check that the camera is functioning correctly.
- If you will be using a VCR as a video source and the image is distorted, select VCR as the input source in the Video Settings Configuration Page.
- At the receiving system, make sure the monitor is switched on and the coaxial cable is connected to the receiver.
- Check the monitor cable and the selection of the monitor channel, if the monitor features more than one video channel.
- If the monitor can display only a single video standard (PAL or NTSC), check the setting of the video output format in the Video Settings Configuration Page.

Testing The Audio Connection

This test procedure applies **only** to units with the audio option.

Test Between Audio-Equipped Transmitter and Audio-Equipped Receiver

1. Connect a microphone (via a preamplifier) to the Line-In RCA jack and a loudspeaker to the Line-Out cinch connectors, or connect a handset to the RJ-11 plug on both units.
2. Make sure the correct menu items are set in the Audio Settings Configuration Pages of both systems; that is, select the appropriate interface (line I/O or handset).
3. Switch the coding mode to G.711 or G.728.
4. Select a volume above zero.
5. After establishing the Ethernet connection, audio should be transmitted both ways.
6. Be sure the level is not set too low and that the right interface is selected.
7. If you cannot hear any audio, check the microphone and loudspeaker together with other audio equipment, and make sure the microphone is switched on if it has a power switch.

Test Between Audio-Equipped Transmitter and PC

1. Connect a microphone (via a preamplifier) to the Line-In cinch plug or connect a handset to the RJ-11 plug on the unit.

2. Make sure the correct menu items are set in the Audio Configuration Page—that is, select the appropriate interface (line in/out or handset).

3. Switch the coding mode to G.711 or G.728.

4. Select a volume above zero.

5. Connect a loudspeaker to the PC's soundcard. After establishing the Ethernet connection, audio should be transmitted both ways.

6. Be sure not to set the level too low. Ensure the right interface is selected.

7. If you cannot hear any audio, check the microphone and loudspeaker together with other equipment. Make sure the microphone is switched on if it has a power switch.

DX3000 Warning Reset Button

PelcoNet displays a warning message if there is a problem with the DX3000 DVR. Click this green button to reset the unit. The codes are defined as follows:

Code	Definition
00	None
01	Hard drive full
02	Hard drive near end
03	No signal
04	Copy or backup or restore—check media
05	Copy or backup or restore—size error
06	Archive full
07	Archive near end
08	Copy or backup—overtake error
09	Copy or backup—near overtake
10	Recording or copy or backup or restore or system—system error
11	Copy or backup or restore—read/write error

SPECIFICATIONS

NETWORK PROTOCOL AND STANDARDS COMPATIBILITY

Internet:	IP, TCP, UDP, ICMP, ARP
Configuration:	HTTP, FTP
Transmission Standards:	H.323 (plus H.225, H.263, G.722, G.723, G.728, G.729)
Video Coding:	H.261, M-JPEG (M-JPEG in Server Push mode only)
Video Format:	CIF (352 x 288), QCIF (176 x 144)
Video Frame Rate:	Up to 30 images/second
Audio Coding:	G.711, G.728
Data Communication and Remote Control:	H.224

INTERFACES

Video Input (transmitter):	BNC, PAL/NTSC, 75 ohms, 1 Vp-p
Video Output (receiver):	BNC, PAL/NTSC, 75 ohms, 1 Vp-p
Audio Input (optional):	RCA type, -32 dBm0, adjustable
Audio Output (optional):	RCA type, -10 to 0 dBm0, 600 ohms
Handset Interface (optional):	RJ-11
LAN Interface:	UTP (10BASE-T), RJ-45
LAN Data Rate:	10 Kbps up to 1 Mbps
Data Interface:	RS-232, DB9M
Control Input:	Detachable screw terminal, for direct connection of contacts
Relay Output:	Detachable screw terminal

POWER ADAPTER

Type:	Plug power adapter
Input Voltage:	100-240 VAC, 50/60 Hz
Output Voltage:	5 VDC, 2A
Country Specific Adapters:	US (default), Australia, Europe, UK

NOTE: *The physical adapter for the wall outlet is interchangeable for use in different countries. The adapter snaps into the plug power supply. Contact your distributor if you need an adapter for a different country. For your own safety, do not open the power supply and never use a do-it-yourself adapter.*

PHYSICAL SPECIFICATION

Dimensions:	4.0 (L) x 4.0 (D) x 1.3 (H) inches (10.16 x 10.16 x 3.30 mm)
Weight:	.88 lb (0.4 kg) (without power supply)

ENVIRONMENTAL SPECIFICATION

Operating Temperature:	32° to 104°F (0° to 40° C)
Operating Humidity:	90% maximum relative humidity, non-condensing

ELECTROMAGNETIC EMISSIONS AND SAFETY

Meets requirements of:	EN 55022, EN 50082-1, EN 60950

GLOSSARY

10BASE-T	IEEE 802.3 specification for 10 Mbs Ethernet
ARP	Address Resolution Protocol
b/s	Bits per second, the actual data rate
Cat5 Cable	Type of cable used on a LAN to connect computers, printers, and transmitters and receivers to a hub on the network
CIF	Common Intermediate Format; video format with 352 x 288 pixels
Default Gateway	The router's IP address (for example, 192.168.0.1)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Service
FTP	File Transfer Protocol
Full duplex	Simultaneous data transmission in both directions
G.711, G.728	Standard audio coding algorithms defined by ITU-T
H.224	Standardized protocol for data communication and remote control
H.261	Standard motion video coding algorithm defined by ITU-T
H.323	Standard for M-JPEG video and audio compression defined by ITU-I
HTTP	Hypertext Transfer Protocol
HTML	Hypertext Markup Language
Hub	A device on the network that connects multiple computers together to form a LAN
ICMP	Internet Control Message Protocol
ID	Identification: machine-readable number or name
IEEE	Institute of Electrical and Electronics Engineers
Internet Protocol	The main protocol used on the Internet. Forms—in conjunction with the Transfer Control Protocol (TCP)—the TCP/IP protocol suite
IP	See Internet Protocol
IP Address	A unique four-byte number that identifies each unit on the Internet or network. Usually written in dotted decimal notation with periods separating the bytes. This address is required to communicate on the network (for example, 192.168.0.100).
ISP	Internet Service Provider

JPEG	Joint Photographic Expert Group (procedure to encode still images)
LAN	See Local Area Network
Local Area Network	Multiple computers linked together into a network to share information within a limited geographic area (such as a building or a campus) controlled by a network operating system and using a transport protocol
MAC Address	Media Access Control/hardware address
NAT	See Network Address Translator
Network Address Translator	A proposal for IP address re-use where the local IP address is mapped to a globally unique address
Picture	A video picture that has been digitized at a particular resolution
PPP	See Point-To-Point Protocol
Point-To-Point Protocol	A protocol allowing a computer using TCP/IP to connect directly to the Internet
Router	A physical device that connects multiple LANs
QCIF	Quarter CIF, video format with 176 x 144 pixels
Server Push	A continuous stream sent from the transmitter to the web browser
Subnet mask	A mask that explains which part of an IP address is the network address and which part composes the host address. It is usually expressed in dotted-decimal notation (for example, 255.255.255.192).
TCP	Transfer Control Protocol
UDP	User Datagram Protocol
URL	Uniform Resource Locator
UTP	Unshielded Twisted Pair
WAN	See Wide Area Network
Wide Area Network	Multiple LANs connected together, usually over a great distance

APPENDIX A – CONNECTING PELCONET TO VARIOUS COMPONENTS

Connecting Pelconet To Various Components With Assorted Keyboards

Connection Scenario 1

Refer to Figure 40 and the instructions that follow.

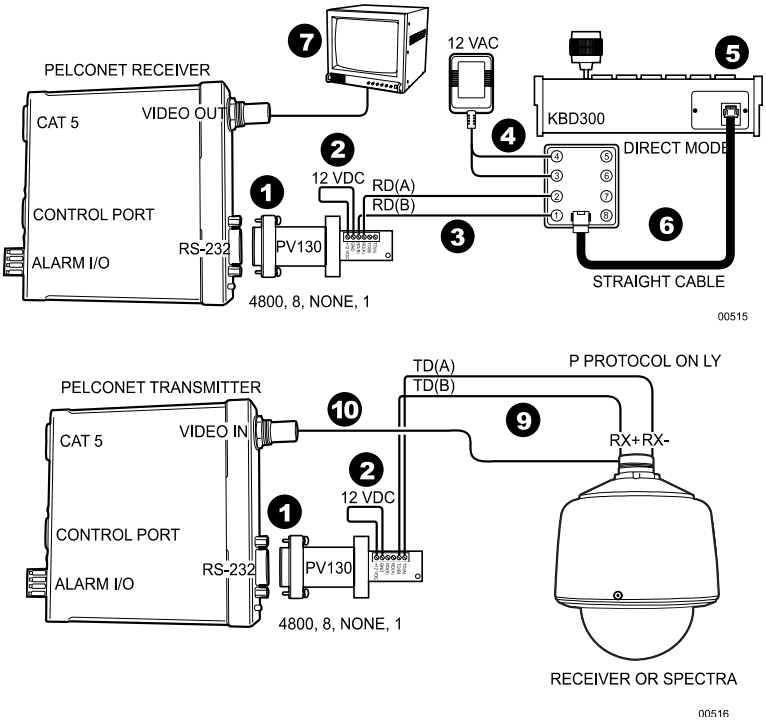


Figure 40. KBD300 (Direct Mode) Connected to a Receiver or Spectra Dome System

1. Connect a PV130 Converter to the RS-232 port on the front of the PelcoNet Transmission System receiver. The data format should be 4800 baud, 8 data bits, no parity, and 1 stop bit.

2. Connect the black and white striped wire from the power supply that comes with the converter to the converter's +12 VDC terminal and the solid black wire to the GND terminal.

3. Connect RD(A) on the converter to terminal 2 on the wall block. Connect RD(B) on the converter to terminal 1 on the wall block.

4. Connect a 12 VAC power supply to terminals 3 and 4 on the wall block.

5. Set the DIP switches on the KBD300 for Direct Mode (switches 1-4 and 7-8 OFF, switch 5 ON). Set switch 6 ON to enable turbo pan operation or OFF to disable the turbo feature.

6. Connect the wall block to the KBD300 with an RJ-45 straight cable.

7. Connect the monitor.

8. Repeat steps 1 and 2 for the transmitter.

9. Connect TD(A) on the converter to the RX- terminal on the Spectra or receiver. Connect TD(B) to the RX+ terminal on the Spectra or receiver. Use P protocol only.

10. Connect the camera video to the transmitter.

Connection Scenario 2

Refer to Figure 41 and the instructions that follow.

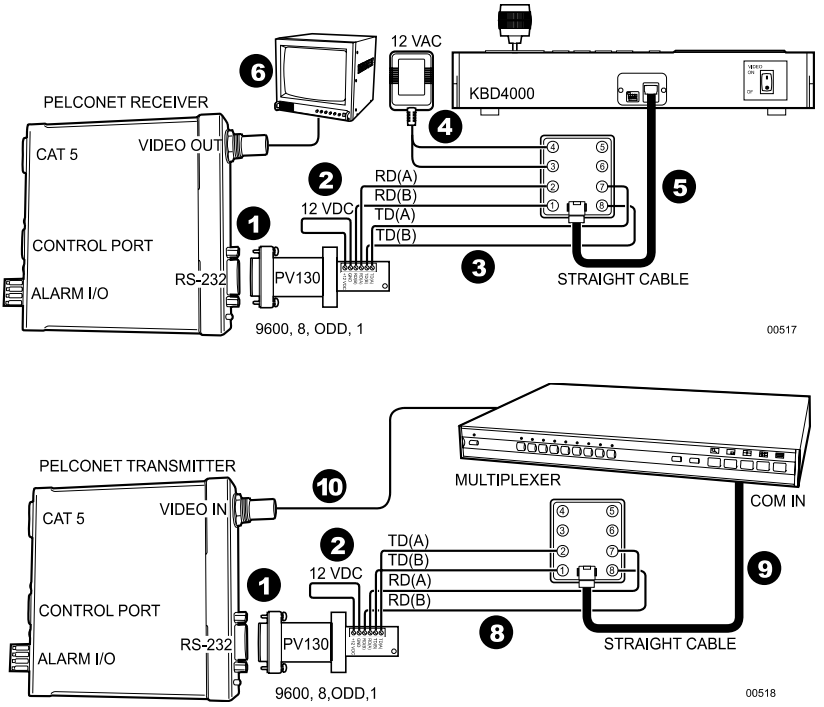


Figure 41. KBD4000 Connected to a Multiplexer

1. Connect a PV130 Converter to the RS-232 port on the front of the PelcoNet Transmission System receiver. The data format should be 9600 baud, 8 data bits, odd parity, and 1 stop bit.

2. Connect the black and white striped wire from the power supply that came with the converter to the converter's +12 VDC terminal and the solid black wire to the GND terminal.

3. Connect TD(A) on the converter to terminal 7 on the wall block. Connect TD(B) on the converter to terminal 8 on the wall block. Connect RD(A) on the converter to terminal 2 on the wall block. Connect RD(B) on the converter to terminal 1 on the wall block.

4. Connect the 12 VAC power supply to terminals 3 and 4 on the wall block.

5. Connect the wall block to the KBD4000 with an RJ-45 straight cable.

6. Connect the monitor.

7. Repeat steps 1 and 2 for the transmitter.

8. Connect TD(A) on the converter to terminal 2 on the wall block. Connect TD(B) on the converter to terminal 1 on the wall block. Connect RD(A) on the converter to terminal 7 on the wall block. Connect RD(B) on the converter to terminal 8 on the wall block.

9. Connect the wall block to COM IN on the multiplexer with an RJ-45 straight cable.

10. Connect MAIN video output from the multiplexer to the transmitter.

Connection Scenario 3

Refer to Figure 42 and the instructions that follow.

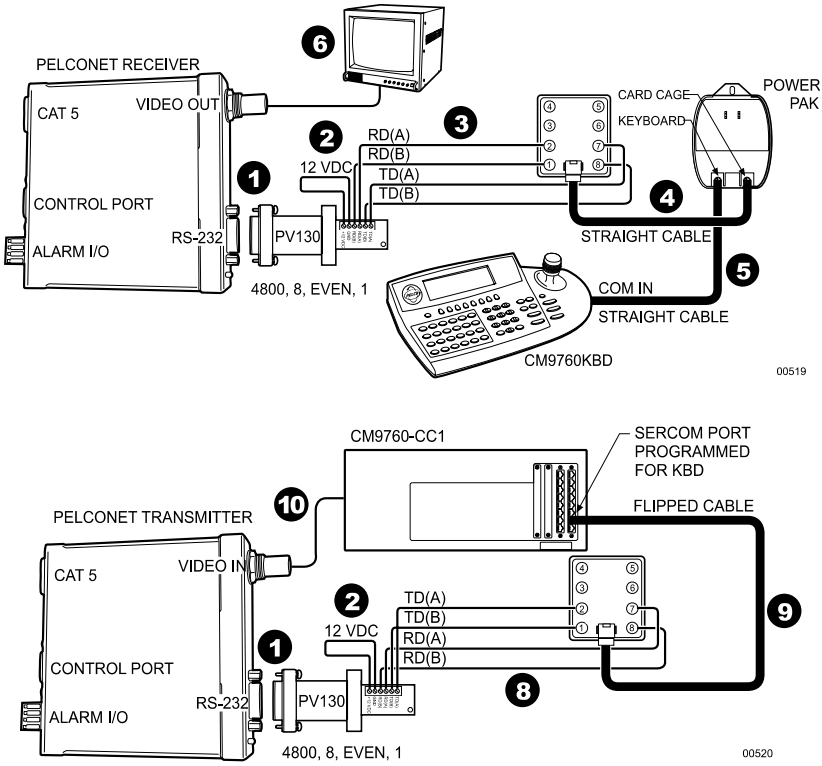


Figure 42. CM9760KBD Connected to a CM9760-CC1 Controller

1. Connect a PV130 Converter to the RS-232 port on the front of the PelcoNet Transmission System receiver. The data format should be 4800 baud, 8 data bits, even parity, and 1 stop bit.

2. Connect the black and white striped wire from the power supply that came with the converter to the converter's +12 VDC terminal and the solid black wire to the GND terminal.

3. Connect TD(A) on the converter to terminal 7 on the wall block. Connect TD(B) on the converter to terminal 8 on the wall block. Connect RD(A) on the converter to terminal 2 on the wall block. Connect RD(B) on the converter to terminal 1 on the wall block.

4. Connect a straight RJ-45 cable from the wall block to the supplied Pelco power pack.

5. Connect a straight RJ-45 cable from the keyboard input connector on the power pack to COM 1 on the keyboard.

6. Connect the monitor.

7. Repeat steps 1 and 2 for transmitter.

8. Connect TD(A) on the converter to terminal 2 on the wall block. Connect TD(B) on the converter to terminal 1 on the wall block. Connect RD(A) on the converter to terminal 7 on the wall block. Connect RD(B) on the converter to terminal 8 on the wall block.

9. Connect a flipped RJ-45 cable from the wall block to Sercom port 5 on the CC1's rear panel.

10. Connect one of the three monitor outputs on the rear of the controller to the transmitter.

Connecting PelcoNet To The Com Out RS-422 Port On a Genex Multiplexer

Refer to Figure 43 and the instructions that follow.

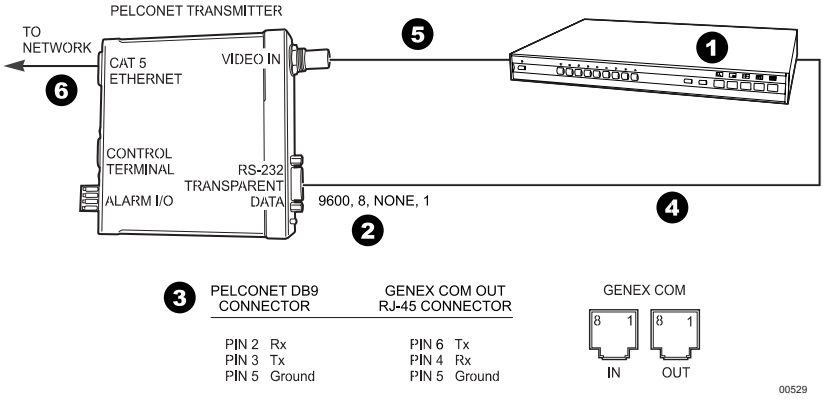


Figure 43. Connecting PelcoNet to Genex Using the COM OUT RS-422 Port

1. Verify that the multiplexer has Version 4.1 firmware. (The version number flashes on the monitor when power is applied to the multiplexer.)

2. Set PelcoNet's transparent data port to 9600 baud, 8 data bits, none (for parity), and 1 stop bit if it is not so set already. This is the default setting.

3. Create a cable using the diagram in Figure 43.

4. Attach the cable's DB9 connector end to PelcoNet's transparent data port. Connect the cable's RJ-45 connector end to COM OUT on the back of the multiplexer.

5. Connect the MAIN video output from the multiplexer to the PelcoNet transmitter.

6. Connect PelcoNet's Ethernet port to the network using a Cat5 Ethernet patch cable.

Connecting a PelcoNet Receiver To a System CM9502

Refer to Figure 44. This configuration lets an operator view and control cameras with a CM9505 keyboard.

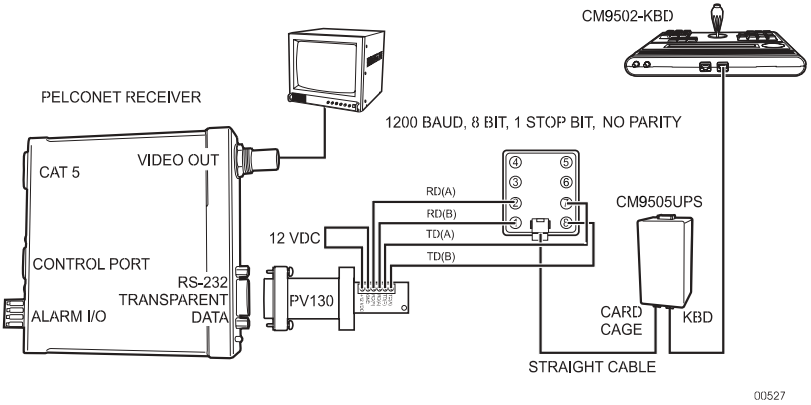


Figure 44. Using PelcoNet with CM9505 to Provide Remote Control

Connecting PelcoNet To a CM9502 ASCII Serial Port

Refer to Figure 45. This configuration lets an operator view and control cameras from a PC using a web browser. (The operator's PC is not shown on the diagram.)

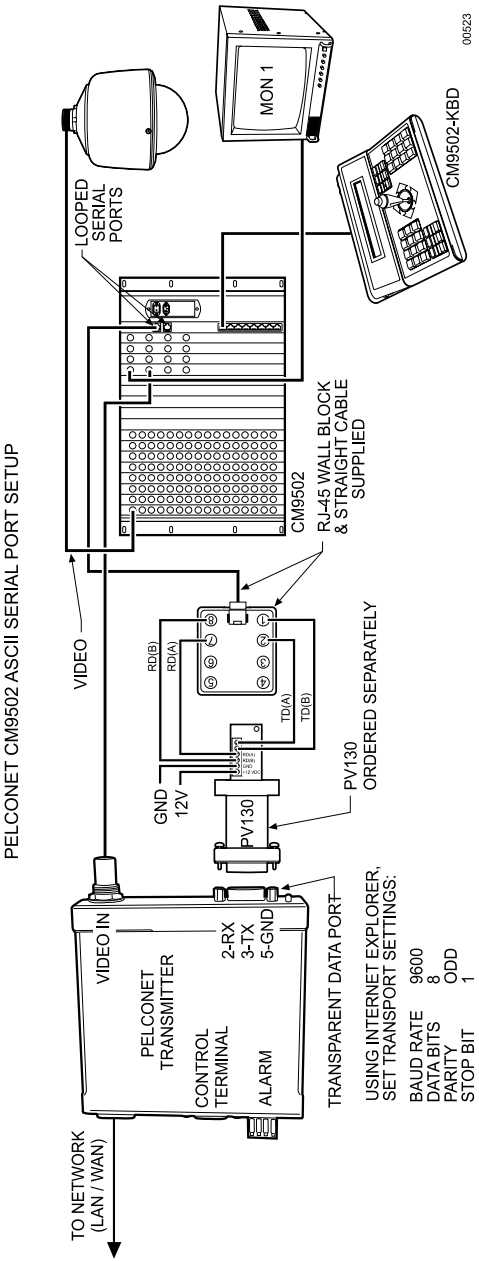


Figure 45. Using PelcoNet with CM9502 to Provide Remote Control

Connecting a PelcoNet Receiver To a System CM8500D

Refer to Figure 46. This configuration lets an operator view and control cameras with a CM8505D keyboard.

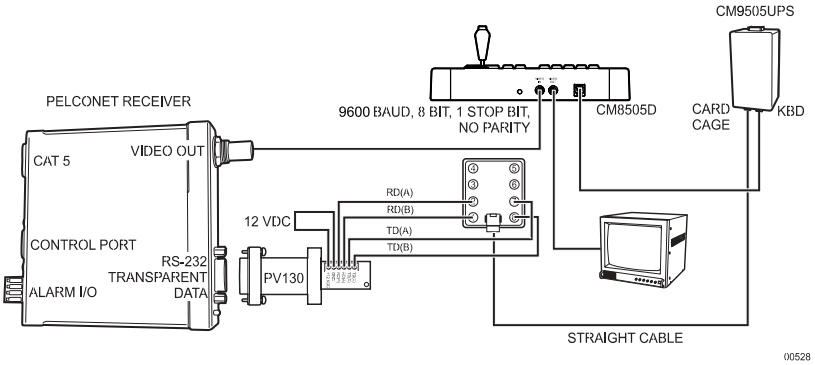


Figure 46. Using PelcoNet with CM8505D to Provide Remote Control

Connecting PelcoNet To a CM6700 And KBD200 For Remote ASCII Control

Refer to Pelco Tech Tip 00-3042 for an illustration (available on Pelco's web site). This configuration lets an operator view and control cameras with a remote KBD200 keyboard.

Connecting PelcoNet To a CM6700 ASCII Port

Refer to Figure 47. This configuration lets an operator view and control cameras from a PC using a web browser. (The operator's PC is not shown on the diagram.)

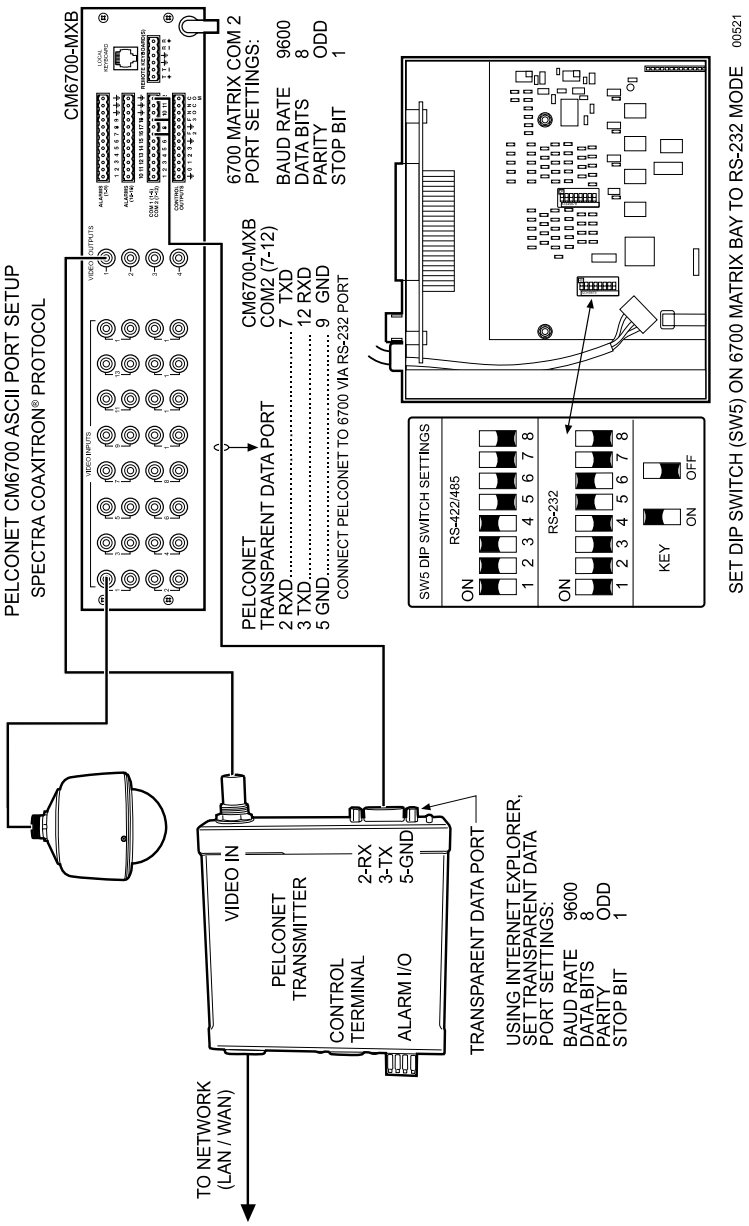


Figure 47. Using PelcoNet with CM6700 to Provide Remote Control

Connecting PelcoNet To CM9760 Equipment For Remote Browser Control

Refer to Figure 48. This configuration lets an operator view and control cameras on a PC using a web browser. (The operator's PC is not shown on the diagram.)

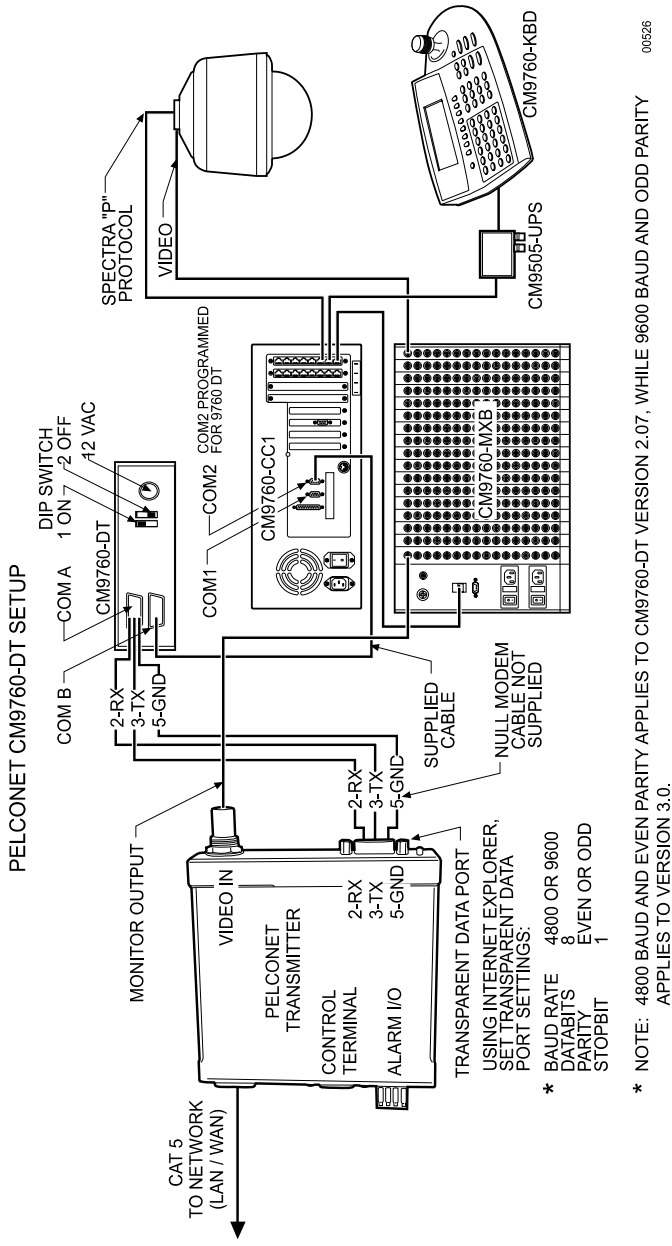


Figure 48. Using PelcoNet with CM9760-DT to Provide Remote Control of a 9760 Monitor Output

Connecting PelcoNet To CM9760 Equipment For Remote Communication

Refer to Figures 49a and 49b. These configurations let an operator remotely view and control cameras connected to the CM9760.

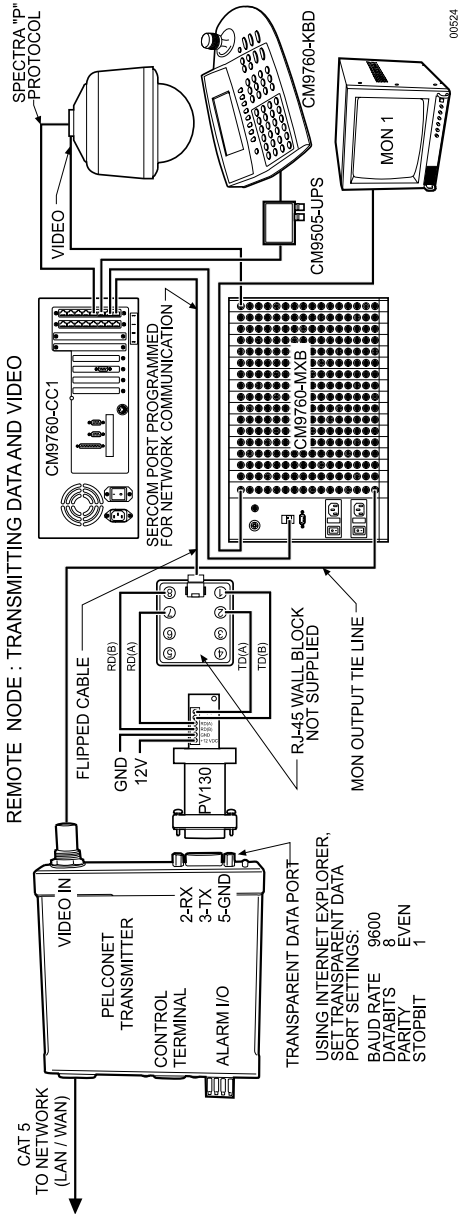


Figure 49a. Using PelcoNet to Transmit Data and Video Between 9760 Nodes

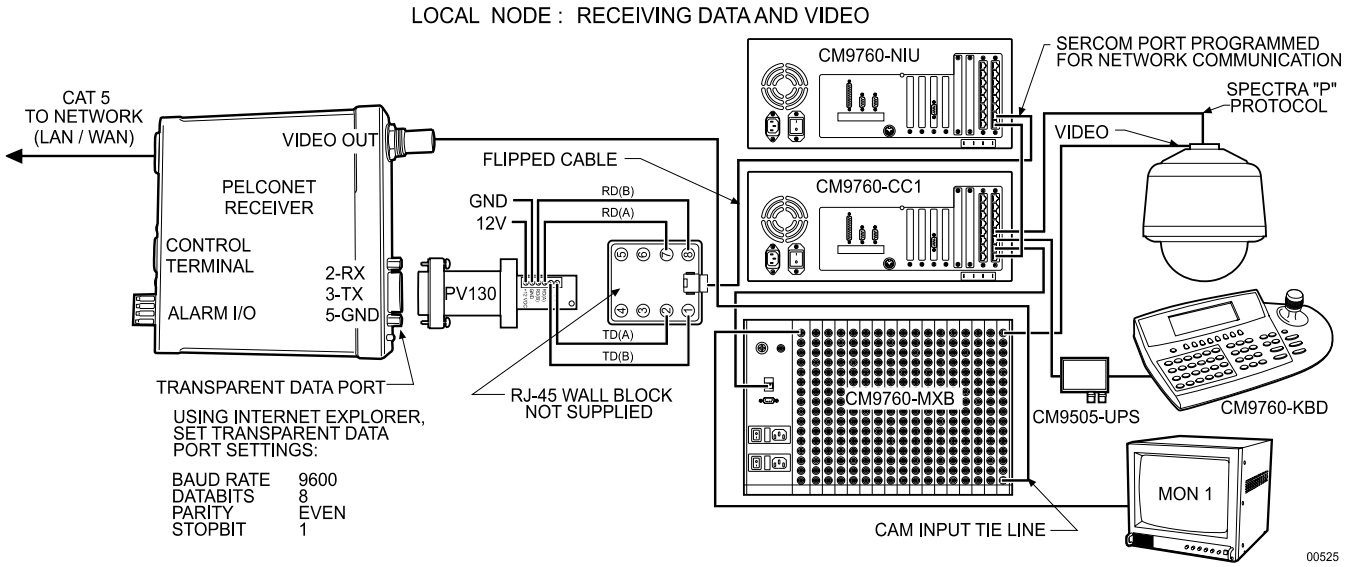
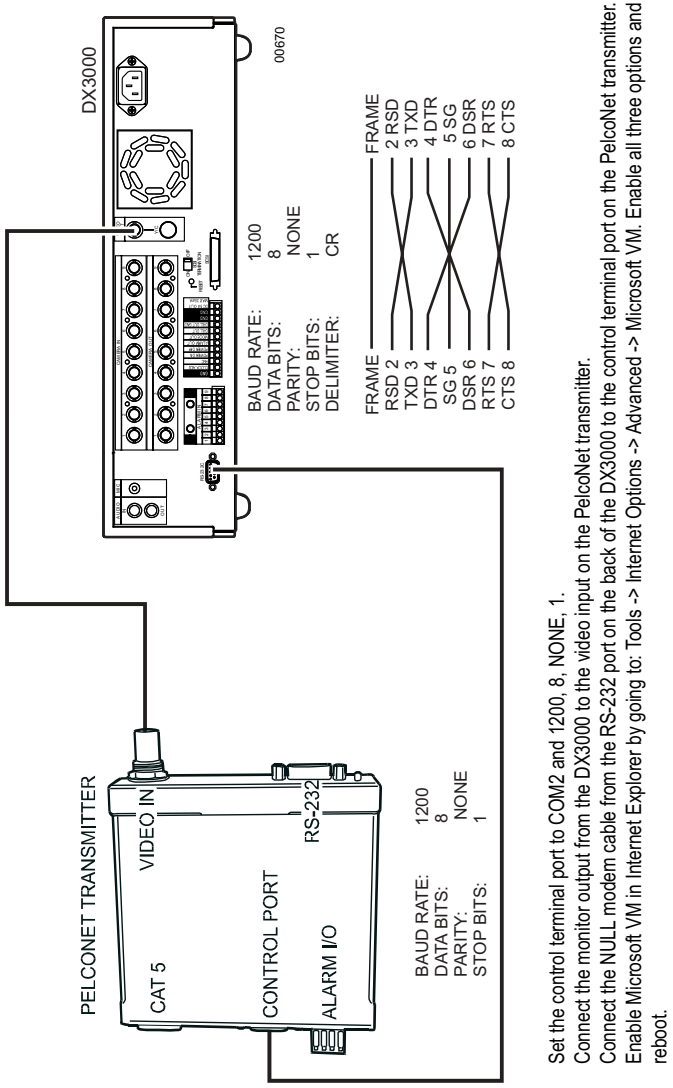


Figure 49b. Using PelcoNet to Transmit Data and Video Between 9760 Nodes

Connecting Pelconet To DX3000 For Recording

Refer to Figure 50. This configuration lets an operator remotely view, record, and playback video on a DX3000 digital video recorder.



- Set the control terminal port to COM2 and 1200, 8, NONE, 1.
- Connect the monitor output from the DX3000 to the video input on the PelcoNet transmitter.
- Connect the NULL modem cable from the RS-232 port on the back of the DX3000 to the control terminal port on the PelcoNet transmitter.
- Enable Microsoft VM in Internet Explorer by going to: Tools -> Internet Options -> Advanced -> Microsoft VM. Enable all three options and reboot.

Figure 50. Using PelcoNet with a DX3000 Recorder

Connecting a Pelconet Transmitter To The CM6800 ASCII Port

Refer to Figure 51. This configuration lets an operator view and control cameras with a PC using a web browser. (The operator's PC is not shown on the diagram.) All settings are done in the CM6800 manager program or through a CM6800 menu. Note the following:

- Port 2 defaults to ASCII and RS-232.
- Ports 7 and 8 can be set to ASCII and RS-232 by using the CM6800 manager program (refer to Figure 51) or by using a CM6800 menu (refer to Figure 52).

Pelco recommends using Port 2.

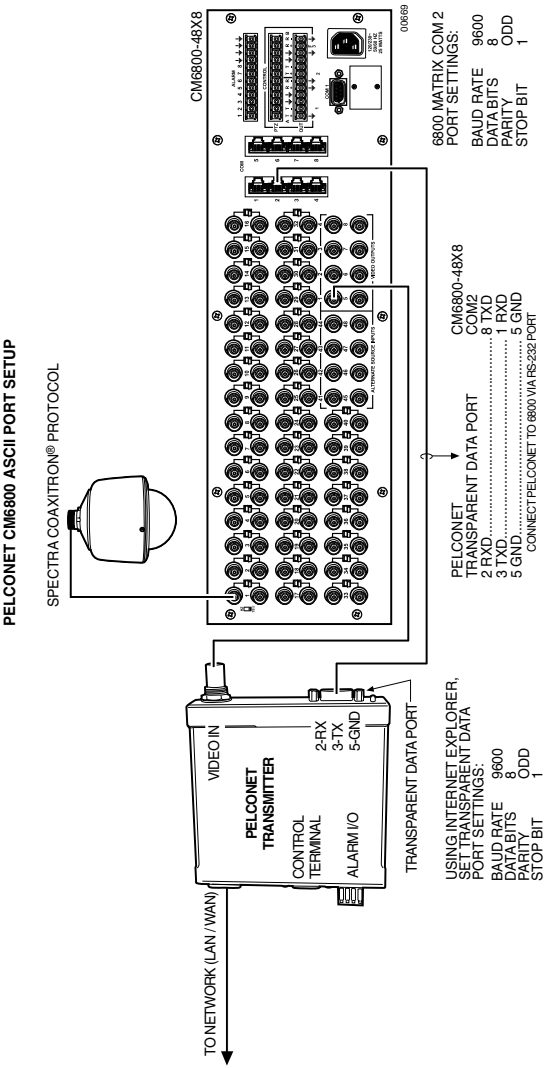


Figure 51. Using PelcoNet with CM6800 to Provide Remote Control

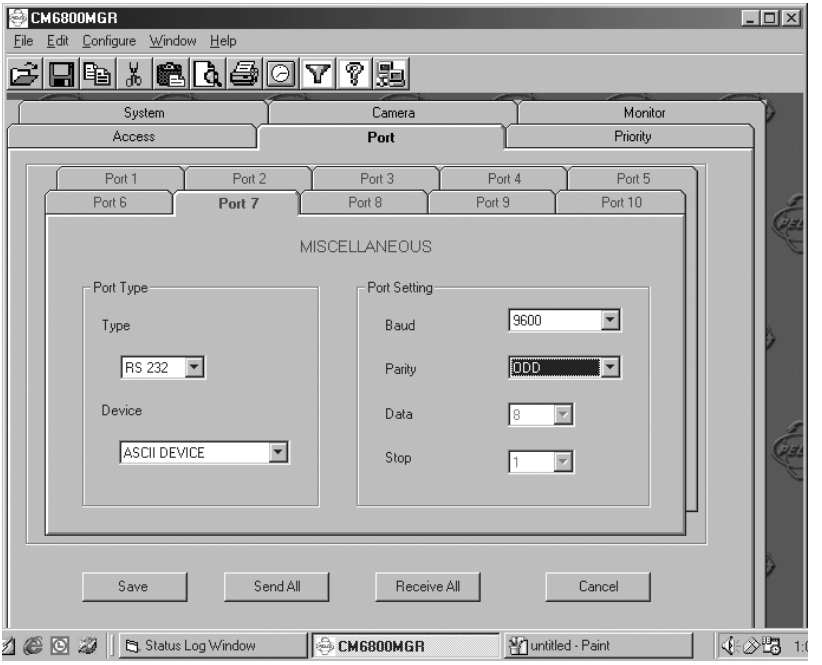


Figure 52. Manager Screen

SET SERIAL PORT 07

DEVICE:	ASCII
TYPE:	RS232
BAUD RATE:	9600
PARITY:	ODD
DATA BITS:	8
STOP BITS:	1

RETURN

Figure 53. Menu Screen

Connecting PelcoNet To a CM6800 and KBD200 For Remote ASCII Control

Refer to Figure 54. This configuration lets an operator view and control cameras with a remote KBD200 keyboard. All settings are done in the CM6800 manager program or through a CM6800 menu. Note the following:

- Port 2 defaults to ASCII and RS-232.
- Ports 7 and 8 can be set to ASCII and RS-232 by using the CM6800 manager program (refer to Figure 52) or by using a CM6800 menu (refer to Figure 53).

Pelco recommends using Port 2.

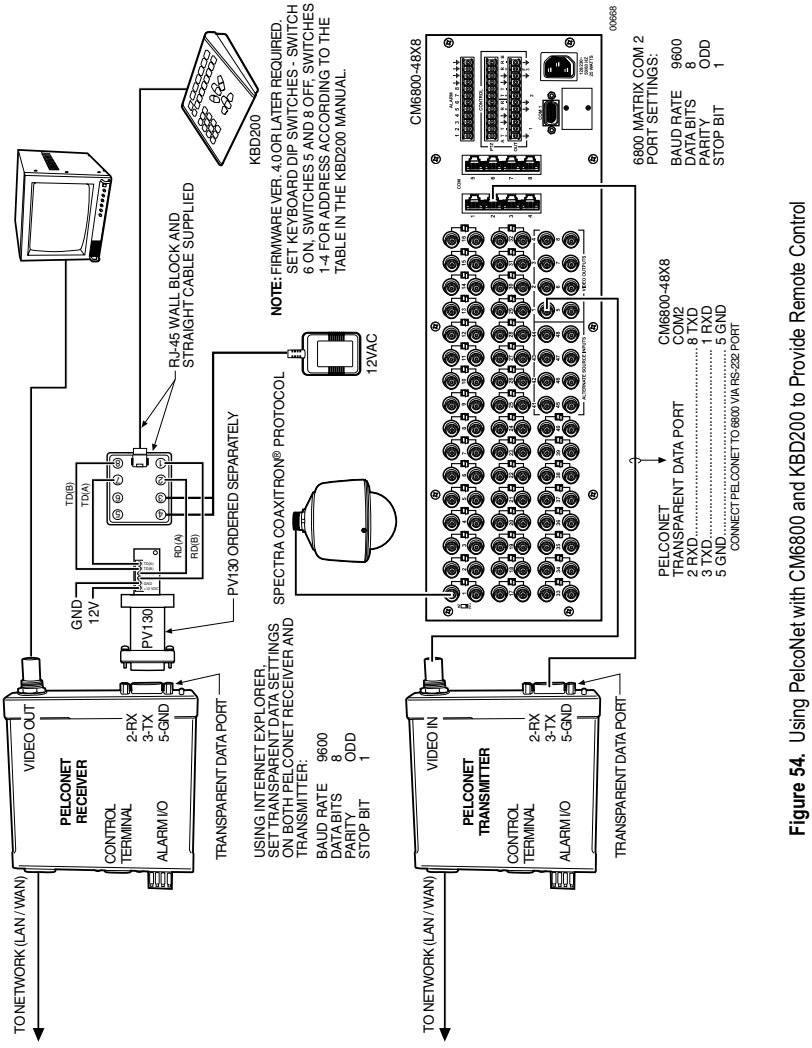


Figure 54. Using PelcoNet with CM6800 and KBD200 to Provide Remote Control

APPENDIX B – FREQUENTLY ASKED QUESTIONS (FAQS)

1. **What Pelco devices can I control from my computer with PelcoNet?**

   PelcoNet can control the following from Internet Explorer:
   - Spectra and Esprit
   - Genex multiplexer
   - DX3009 and DX3016 digital video recorders
   - CM9760 matrix (requires CM9760 data translator)
   - CM9740 matrix (requires CM9760 data translator)
   - CM9502 matrix (through integrated ASCII port)
   - CM8500 matrix (requires latest CM8500 data translator)
   - CM6700 matrix (through integrated ASCII port, COM 2)

2. **What TCP/IP ports does PelcoNet use?**

   PelcoNet lets you select which base port to use. The default is 25000. This means PelcoNet will use TCP ports 25000-25001 and UDP ports 25002-25011 (12 ports total) for all video and control data. The ports must be open for PelcoNet to function properly.

3. **Can I view PelcoNet over the Internet?**

   Yes. You will need a static IP address and enough bandwidth to view live video. Pelco recommends a minimum of 250 Kbps for medium image quality. Also check with your ISP to verify the correct TCP and UDP ports are open through any routers or firewalls through which you will connect. The base ports are adjustable in PelcoNet. For example, if you choose port 25000 (default), it will use TCP ports 25000-25001 and UDP ports 25002-25011 (12 ports total) for all communication: video and control.

4. **How many connections does PelcoNet support? Can more than one receiver connect to a transmitter at the same time?**

   Yes. PelcoNet can support an unlimited number of simultaneous connections. To do so, all hubs, switches, and routers must support multicasting (IGMP), and PelcoNet must be configured to use multicasting. If the network hardware does not support this, then the maximum number of simultaneous connections is five.

5. **Can I enlarge the picture size in the browser?**

   Yes. You can select from two different image sizes in PelcoNet with the browser: 288 x 352 or 576 x 704.

6. **What software does PelcoNet require?**

   PelcoNet works with Internet Explorer 5.0 or higher. An ActiveX plug-in is also required for Internet Explorer to get live video. All software is included.

7. **Can I control other manufacturers' equipment from the browser?**

   Not at this time.

8. **Can I record video with PelcoNet?**

   Yes. PelcoNet can record video to the hard drive of the viewing PC. The video is recorded in AVI format, which allows playback through either the browser or Windows Media Player.

9. **Everything is wired correctly but I do not have any control from the browser. What else could be wrong?**

   The Transparent Data port settings should be set to match the equipment to which PelcoNet is connected.

   Also, in Internet Explorer, the Microsoft Virtual Machine should be enabled. To do so: on the Tools menu, select **Internet Options**. Then select the **Advanced** tab. Locate the option **Microsoft VM**. Place a checkmark next to **Java Console Enabled** and **JIT compiler for virtual machine enabled**. Reboot your computer.

   These options are required for the Java applets in PelcoNet to function properly.

10. **Can I control the Genex multiplexer from the browser and have a local KBD4000?**

    Yes. You must have Genex Version 4.1 or higher. This version lets you connect a KBD4000 to the COM IN port, and PelcoNet to the COM OUT port. This gives you both local and remote control. Refer to *Connecting Pelconet to the COM OUT RS-422 Port on a Genex Multiplexer* in Appendix A for detailed information.

11. **Can I control the Genex multiplexer server?**

    Not at this time.

12. **Can I use DHCP (dynamically assigned IP address) with PelcoNet?**

    No. PelcoNet requires a static IP address.

13. **What type of compression does PelcoNet use?**

    PelcoNet uses the H.323 standard. H.323 is an industry standard for video teleconferencing over the Internet. It provides the most effective use of bandwidth with excellent video quality.

14. **I do not get live video in the browser but server push is working. What could be wrong?**

    Verify that the ActiveX plug-in is installed and that your video is set to 16-bit color. Also check with your network administrator to verify that the TCP/IP ports PelcoNet uses are not being filtered and that you have enough bandwidth.

15. **How do I program PelcoNet with HyperTerminal?**

    Using a null modem cable, connect a COM port on your PC to the Control Terminal port on PelcoNet. Open HyperTerminal and set the port to use to 19200, 8, N, 1, and No Flow Control. Type ?, and follow the help menu.

16. **How much bandwidth does PelcoNet use?**

    PelcoNet's bandwidth is adjustable. You can set it from 10 Kbps up to 1 Mbps. Pelco recommends a minimum of 250 Kbps for live video at medium image quality. Check with your network administrator for how much bandwidth to use.

17. **Can I use PelcoNet with a DSL or cable connection?**

    Yes. You will need a static IP address from your provider. Also verify what kind of bandwidth you will get since it varies by location. Verify that your provider is not filtering the TCP/IP ports that PelcoNet uses.

18. **Is an RS-232 to RS-422/485 converter required for control with PelcoNet?**

    PelcoNet's control port is RS-232, so any device that uses RS-422 for control will need a converter. Pelco's Spectra, Esprit, Genex (COM IN), CM9760, CM9740, CM9502, KBD200, KBD300, KBD4000, CM9760KBD, and others use RS-422 for control.

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WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship for a period of one year after the date of shipment. Exceptions to this warranty are as noted below:

- Five years on Pelco manufactured cameras (CC3500/CC3600/CC3700 and MC3500/MC3600 Series); two years on all other cameras.
- Three years on Genex® Series (multiplexers, server, and keyboard).
- Two years on all standard motorized or fixed focal length lenses.
- Two years on Legacy®, Camclosure™ Camera Systems, CM6700/CM6800/CM8500/CM9500/CM9740/CM9760 Matrix, DF5 and DF8 Series Fixed Dome products.
- Two years on Spectra®, Esprit™, and PS20 Scanners, including when used in continuous motion applications.
- Two years on Esprit and WW5700 series window wiper (excluding wiper blades).
- Eighteen months on DX Series digital video recorders.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico:

Service Department
Pelco
3500 Pelco Way
Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico:

Intermediate Consignee
American Overseas Air Freight
320 Beach Road
Burlingame, CA 94010
USA

Ultimate Consignee
Pelco
3500 Pelco Way
Clovis, CA 93612-5699
USA

REVISION HISTORY

Manual #	Date	Comments
C1977M	5/00	Original version.
C1977M-A	5/01	Revised the General, Video, Audio, Alarm, and Interface Settings Configuration pages and their documentation. Revised the System 9760, Genex, and Spectra Control pages and their documentation. Added the Esprit and DX3000 Control pages and their documentation. Added material about setting motion detection and about recording/playback on the PC's hard drive. Added Appendices A and B.
C1977M-B	6/01	Added documentation on the warning reset button.
C1977M-C	7/01	Changed "System 9760" control pages name to "Matrix Control." Changed "DX3009" control pages name to "DX3016," added camera buttons 10-16, added 16-grid button, and removed the "C" button.
C1977M-D	6/02	Changed "active high" and "active low" to "Normally Open" and "Normally Closed" on the Alarm Settings configuration screen.